SEPTEMBER, 1957

Commercial Fertilizer

and PLANT FOOD INDUSTRY

QUIZ

For Multiwall Bag Buyers

"How Does Your Packaging Operation Rate?"

Perhaps we may be able to help you to arrive at the right answers in order to achieve higher production at lower costs.

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary

630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.

Plants at St. Marys, Ga. and Gilman, Vt.

Sales Agents for The **Kraftpacker** Open Mouth Bag Filling Machine

Gilman PAPER CO.
• St. Marys Kraft Corp.
• Gummed Tape Div.
• The Gilman Corp.
• Kraft Bag Corp.

☐ O.K. Kraft...Help me to answer your Quiz.
Please have representative call.

COMPANY_____

ADDRESS_____ ZONE____ STATE_____

CITY_____

PRODUCT MFD._____

NAME_____

..and quality you can *talk* about!

NUTRONITE IS THE QUALITY, NATURAL ORGANIC SUPPLEMENT TO CHEMICAL PLANT FOODS

Nutronite (formerly Smirow) adds to the selling power of your mixed fertilizers. Plainly visible Nutronite assures your customers of added growth and profits . . . brings back satisfied customers year after year.

Nutronite is the 100 percent natural organic addition to mixed fertilizers. Its nitrogen is 90% water insoluble and 90% available—for that all-season effect on plant growth.

Nutrition + Nitrogen = Nutronite

Let us figure the cost of Nutronite delivered to your plant.

SMITH NUTRONITE ROWLAND

SMITH-ROWLAND CO.

P. O. Box 1219, Norfolk 1, Va.

A DIVISION OF SMITH DOUGLASS COMPANY, INCORPORATED

PREMIUM PRODUCT

through 8 on 10 mesh

MINIMUM INVESTMENT AND MANPOWER

The Weatherly DiaPhos Process has made it possible for you to build, on a sound economic basis, 25,000 ton integrated ammonium phosphate plants, producing such grades as 16-20-0; 14-14-14; 13-39-0; 6-24-24; 11-48-0, granulated and of such unparalleled uniformity that they go through 8 and remain on 10-mesh screen.

This is premium merchandise.

These plants produce their own sulphuric and phosphoric acids. They operate with a minimum of manpower. They offer the opportunity to build one or a chain of them with low capital investment.

A whole new field of neighborly service to the farmer, in compact, profitable, marketing areas, has been opened up to you.

THANKS TO WEATHERLY **DiaPhos** PROCESS

The D. M. WEATHERLY COMPANY

Industrial Engineers and Builders

80 Eleventh St., N.E., Atlanta, Georgia Phone: TRinity 5-7986

Published Monthly by
WALTER W. BROWN PUBLISHING CO., INC.
75 Third St., N. W., Atlanta 8, Ga.
Phone TRinity 4-4160

President
ERNEST H. ABERNETHY

Editor
BRUCE MORAN

Managing Editor
CLAY W. PENICK, JR.

Business Manager
V. T. CRENSHAW

Chicago Representative
ELON A. ABERNETHY
1753 Howard St.—Room 200
Chicago 26, Illinois
Phone Rogers Park 4-5616

West Coast Representative
M. A. CALDWELL
2267 W. 24th St., Los Angeles, Cal.
Phone REPUBLIC 1-3050

Address all inquiries, advertising and editorial material, and correspondence to Atlanta Publishing Offices, sending direct to COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, 75 Third St. N. W., Atlanta 8, Georgia.

Vol. 95 No. 3 *Established 1910* September, 1957

Commercial Fertilizer
and PLANT FOOD INDUSTRY

Subscription rates: United States, $3.00 per year; 5 years, $12.00. Foreign $5.00 per year.

Contents

Just Around the Corner, by *Vernon Mount* 10
NPFI Completes 'Round Table' Plans 16
Schultz Heads New Pennsylvania PFES 23
FOREST TREE FERTILIZATION
Status 24
Southern Pines 27
Potential 28
Mixing Minor Elements and Pesticides with Fertilizer, by *C. E. Floyd* 32
Productivity of Mountain Meadows 35
CFA Range Fertilizer Booklet 35
Research Results and Reports 36
Random Notes & Quotes 37
Associations 40
Control Officials Program 42
Iowa Plant Food's New Screening Operation 44
Around the Map 45
Price's Plant Continues Modernizing 47
Southwest Conference "Most Successful" 48
Changes 52
Personals 53
West German Capacity Expanding 56
Tonnage Table and Markets 57
Obituaries 59
Industry Calendar 59
Classified Advertising 63
Index to Advertisers 64

COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, entered as second class matter, October 12, 1910, at the post office at Atlanta, under the Act of March 3, 1879. Published monthly except semi-monthly in September, by Walter W. Brown Publishing Co., Inc., 75 Third St., N. W., Atlanta 8, Georgia.

Commenting Freely

by Bruce Moran

Perhaps it is old age creeping up on me, perhaps just advancing wisdom—but I refuse to get excited about the gyrations of economics or politics. For the pendulum swings back and forth, and things average up just as surely as water seeks its own level. Take the labor hearings as an example.

I can remember all too clearly the "trust busting" days of Teddy Roosevelt. Commerce and industry went too far and were curbed. Now labor has gone too far, and the curb is beginning to tighten and to be felt even in case-hardened jaws.

It is well to bear all this in mind. There is such a thing as growing too big and too powerful—however justifiable it may be from an economic standpoint. For power carried too far defeats itself in the long run.

The pendulum swings slowly, but it always swings. And as they used to declaim in the old melodramas, justice and right will always triumph in the end. It's just a matter of who is the villain at the moment!

"A complete chain of 'EXTRAS'– that's why we use International's Triple,"

says E. D. KINGSBURY, *of Kingsbury & Company, Inc., Indianapolis*

MORE and more fertilizer manufacturers like E. D. Kingsbury find International supplies far more than a superior product. "We like the way International emphasizes research, develops new products, pioneers new approaches to shipping and technical service. These are all 'EXTRAS' that are reflected in savings when we buy International Triple.

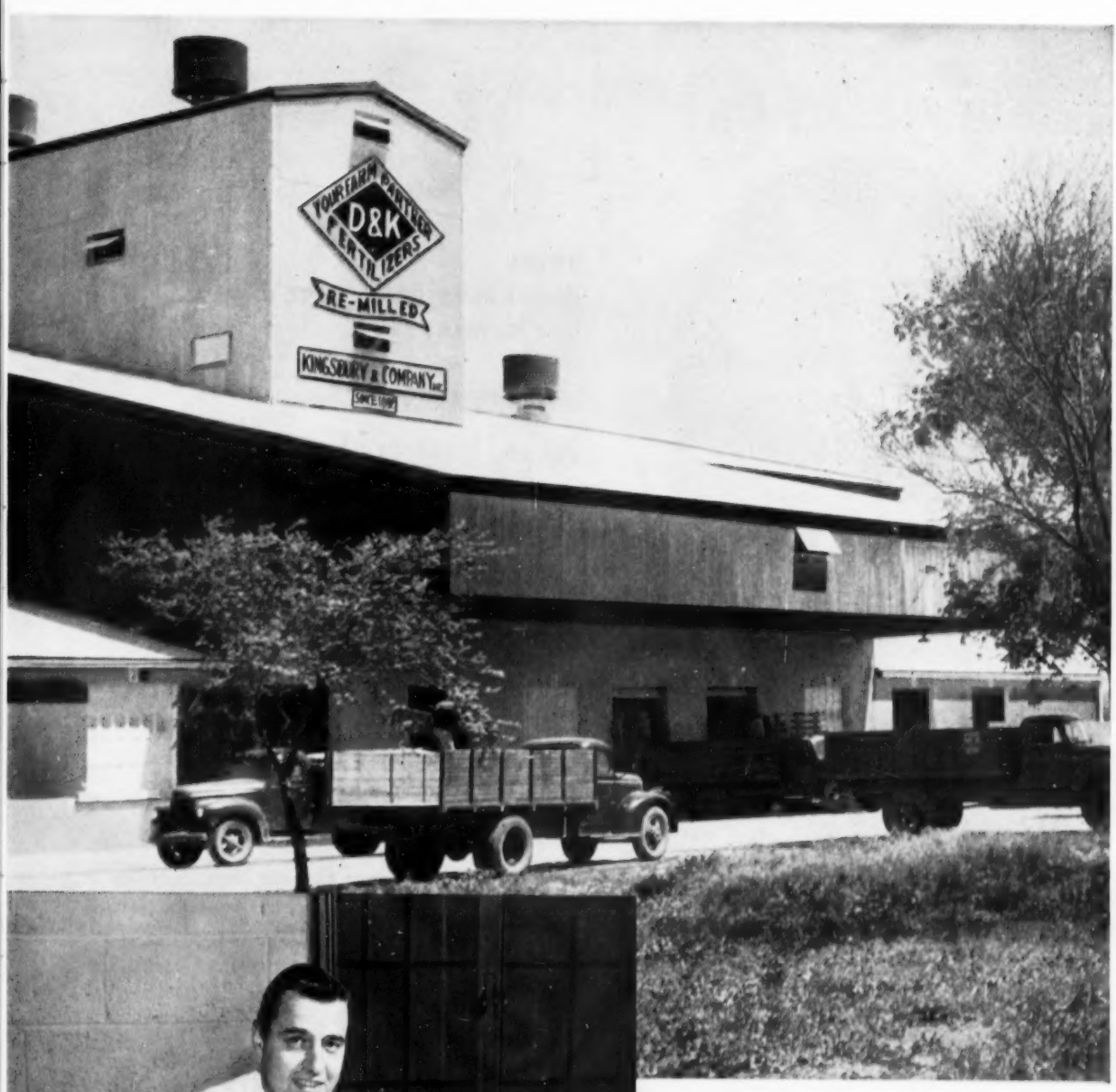
"Consistency in high analysis and the particle size of the product also contribute to savings in formulation and granulation.

"In addition, International's good scheduling is very important in the height of the season. The best ingredients in the world are worthless to us if they aren't in our plant on schedule."

(You can realize similar savings in time, handling, formulation and granulation. Write or wire for details.)

Vice President E. D. Kingsbury, left, and Plant Superintendent W. N. Brinson report: "International's consistency of product and ease of handling prove important to our production."

Typical of the Kingsbury pace in modernization is this multi-control panel giving one man complete command over machine speed, material flow. The 60-year-old D & K line includes 15 grades of commercial fertilizer.



The Kingsbury organization gears customer service to the same efficient scheduling and fast delivery they insist from suppliers. At the Peru, Indiana plant ample dock space and modern facilities keep D & K buyers on top of field operations.

Vice-President E. D. Kingsbury (at left) along with his father, President George H. Kingsbury handle management duties at both Indianapolis and Peru plants.

INTERNATIONAL MINERALS *International* **& CHEMICAL CORPORATION**

PHOSPHATE CHEMICALS DIVISION .... 20 N. WACKER DRIVE, CHICAGO 6, ILL.

JUST AROUND THE CORNER *by Vernon Mount*

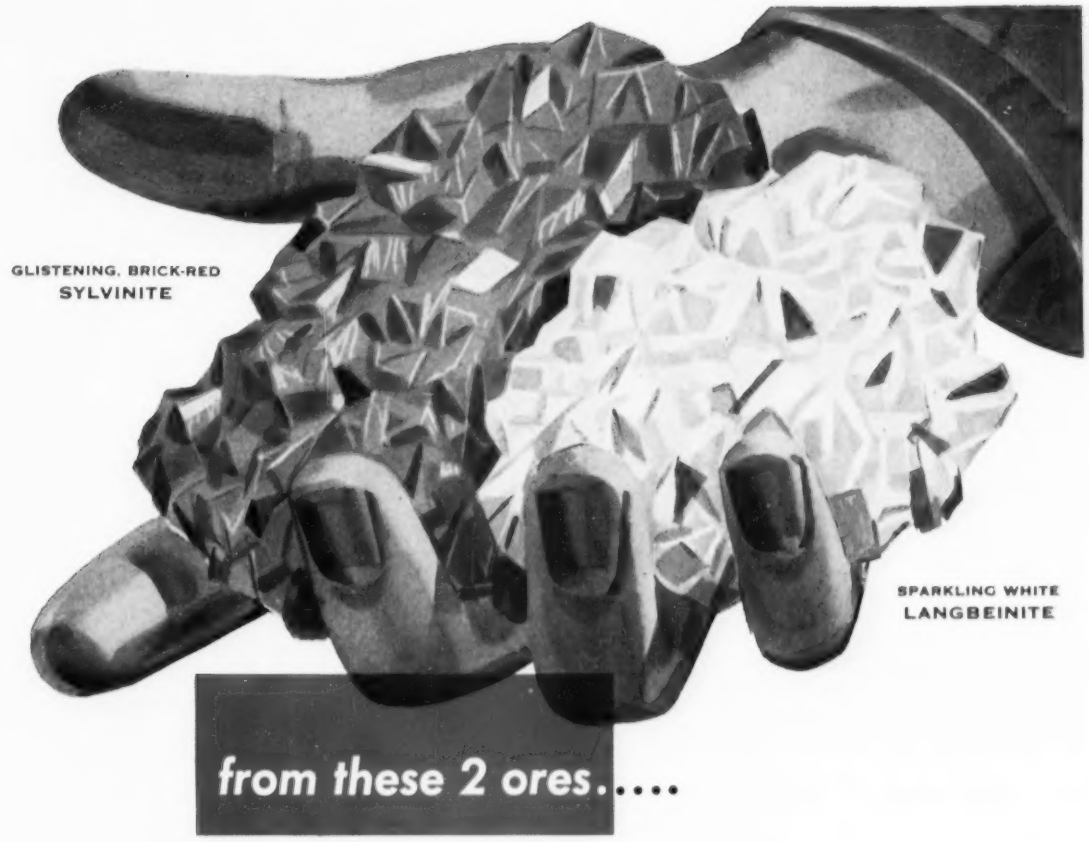
LEVELLING OFF seems to describe the process through which our economy is going this year. Prices are beginning to steady down. The income of workers is holding, especially since the labor racket hearings have quieted strike plans. There are no signs of deflation, but inflation seems to be slowing.

EASIER MONEY – but not too easy – is ahead, and that should make next year a year of regeneration, of renaissance, of looking forward to bigger things, and getting ready for them in a practical way.

WHICH IS NOT TO SAY that we are in a slump, but on a plateau, gathering our forces for the next climb up the graphs. But it is also a fact that not everybody will find his graphs going up next year. May you all be among the first category!

Yours faithfully

Vernon Mount



4 potash products for all your potash needs

From SYLVINITE . . . standard and granular muriate of potash.

From LANGBEINITE . . . SUL-PO-MAG® (double sulphate of potash-magnesia).

From BOTH ORES . . . sulphate of potash.

These two basic potassium ores can supply *your complete potash needs* for mixed fertilizers. After mining and refining, they are available in these four forms:

1. Standard 60% K_2O Muriate of Potash for mixed fertilizers.
2. Granular 60% K_2O Muriate of Potash for mixed fertilizers and direct application.
3. 50 to 52% K_2O Sulphate of Potash for *premium* mixed fertilizers.
4. SUL-PO-MAG (22% K_2O—18% MgO)—premium potash and water-soluble magnesium for *premium* mixed fertilizers.

You can get *all four* of these products, for all your potash needs, from *one source* of supply. Other advantages: uniform quality in every pound; time-saving convenience in ordering and scheduling, and personalized sales and service from experienced people at your nearest district sales office:

ATLANTA, GA.— 1325 Fulton National Bank Bldg., M. S. Malone, *District Sales Manager.*

CHICAGO, ILL.— 20 North Wacker Drive, C. E. Martin, *District Sales Manager.*

NEW YORK, N. Y.— 485 Lexington Ave., W. W. Chadwick, *District Sales Manager.*

SHREVEPORT, LA.—418 Market St., J. K. Lindsey, *District Sales Manager.*

POTASH DIVISION PRODUCTS: For Agriculture—Sulphate of Potash, Muriate of Potash, Sul-Po-Mag,® Stock Salt. For Industry—Potassium Chloride, Sulphate of Potash, Muriate of Potash, Muriatic Acid, Caustic Potash, Carbonate of Potash, Liquid Chlorine, Magnesium Oxide. Mines at Carlsbad, New Mexico. Plants at Carlsbad, New Mexico, and Niagara Falls, New York.

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

POTASH DIVISION . . . . . 20 N. WACKER DRIVE, CHICAGO 6, ILL.

BENCH-SCALE DISTILLATION EQUIPMENT. The Center has various types and sizes of apparatus to distill any size sample from one cc to a tank-car load.

Unique Lummus Engineering Development Center—30 Minutes From Manhattan—Proves Out Processes Before Construction

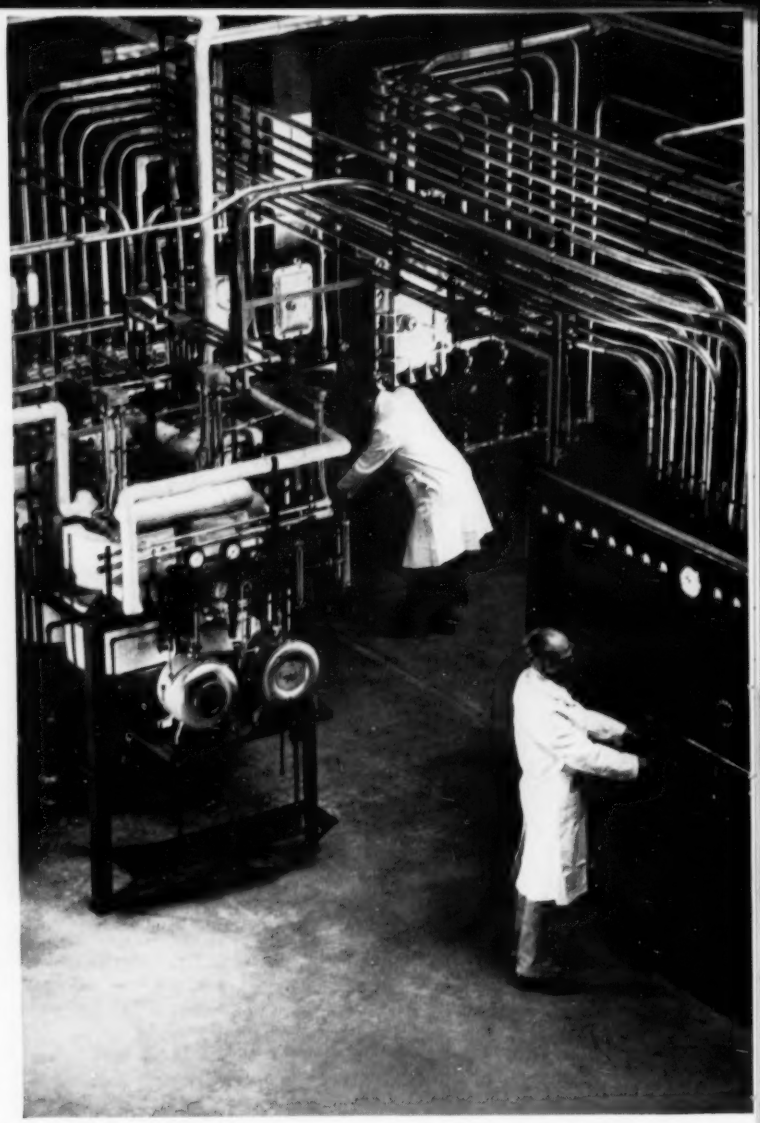
At a new 150,000 square-foot Center near the Newark Airport, the Lummus Company is expanding a long-established engineering development program into a major service to the process industries. The intensive pilot plant investigations carried out here will, in the years to come, spell the difference between rash gamble and sound plant investment for many manufacturers in the chemical, petroleum, pulp and paper and allied fields.

For a complete description of The Center and how it can help you bridge the gap between laboratory research and successful production, write for the 16-page brochure "Lummus Engineering Development Center." Address The Lummus Company, 385 Madison Avenue, New York 17, New York.

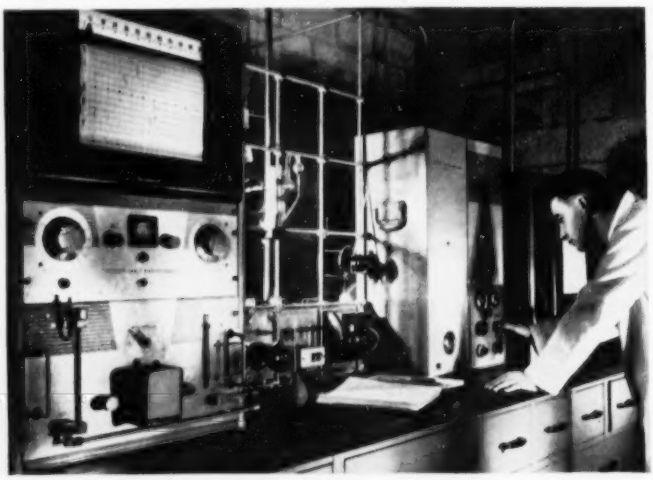
LUMMUS

ENGINEERS AND CONSTRUCTORS FOR INDUSTRY

NEW YORK • HOUSTON • BATON ROUGE • CHICAGO • MONTREAL
CARACAS • LONDON • PARIS • THE HAGUE • BOMBAY



MOST PILOT UNITS at The Center are put together from standard "building blocks." Skid-mounted charging units such as the one at left hold tanks, heaters and pumps for transfer and metering. Process equipment, here shown in background center, can be widely varied. At right is electrical control cabinet. All switches, relays and controls not housed in explosion-proof boxes are enclosed in cabinets like this one, pressurized with outside air to exclude process vapors.



ANALYSIS OF MATERIALS processed and produced in pilot operations at The Center is an important part of the work carried out by Lummus engineers. Here a laboratory technician determines the composition of a multiple-component gas, using a gas chromatography technique.

Now! More Technical Field Service from Du Pont

JOHN SPICER, JR., technical specialist for the southeastern states, with headquarters in Goldsboro, N. C.

OVE. F. JENSEN will serve manufacturers in the midwestern states, with headquarters in Maple City, Michigan.

PHIL B. TURNER will provide technical counsel for plants in the Northeast, and will work from Wilmington, Del.

These specialists on URAMON® Ammonia Liquors are ready to answer your specific formulating problems

Du Pont expands technical service to fertilizer manufacturers to aid in formulating today's complex mixtures with "Uramon" Ammonia Liquors.

This field staff is an addition to Du Pont's technically trained sales force and many other service facilities. Manufacturers are invited to call on the technical experience and training of these specialists for at-the-plant advice on how to formulate properly with Du Pont UAL.

For further information on the formulations of UAL best suited to your use, and to request the services of this new specialist group, write:

HERE ARE OTHER IMPORTANT ADVANTAGES OF DU PONT URAMON® AMMONIA LIQUORS

- Safe in granulation . . . no danger of flash fires and less stack. Gives firm, uniform granules, which are best for storage and application.
- High-quality nitrogen from UAL resists leaching . . . supplies both urea and ammonium forms of nitrogen.
- Won't corrode regular fertilizer-manufacturing equipment, including ordinary steel and aluminum.
- Gives mixed goods better "feel"—minimizes caking, segregation and dusting.
- Prompt, dependable delivery enables you to schedule your production with confidence.
- Suitable for either batch or continuous mixing.

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Department
Wilmington 98, Delaware

DU PONT
REG. U.S. PAT. OFF.

URAMON®
AMMONIA LIQUORS

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

NPFI Completes Round Table Plans

The forthcoming Round Table, to be held at the Sheraton Park Hotel, Washington, D. C., will comprise five half-day sessions, beginning at 1:30 p.m. on November 6th and adjourning in the P.M. of November 8th. No formal papers will be given. This year's meetings will be devoted exclusively to a discussion of questions received from the membership.

Each session will concentrate on one and related phases of fertilizer manufacture. The first session will deal with a) standardization of raw materials; b) formulations, theory and practice; and c) chemical control.

Session 2 is concerned with problems associated with ammoniation.

Session 3 deals with granulation.

Sessions 4 and 5 will be devoted to: a) manufacture of superphosphates; b) liquid fertilizers; c) plant effluents; d) instrumentation; e) maintenance.

More than 100 good practical items will be discussed by persons selected by the membership for their known knowledge and general competence. Owing to the large attendance of the past two years the Executive Committee hit upon the plan of selecting about 20 persons who would each lead the discussion of the items assigned him and stimulate additional discussion from the floor. By this method the spirit of free discussion by members will be retained regardless of the size of the attendance. This plan has received the enthusiastic endorsement of the membership. A very worthwhile Round Table on fertilizer production problems can be expected.

ASA Golden Jubilee Celebration Nov. 18-22

America's agronomists—scientists in farm crops and soils—will celebrate their Golden Jubilee at the 50th annual meeting of the American Society of Agronomy Nov. 18-22 at Atlanta, Ga.

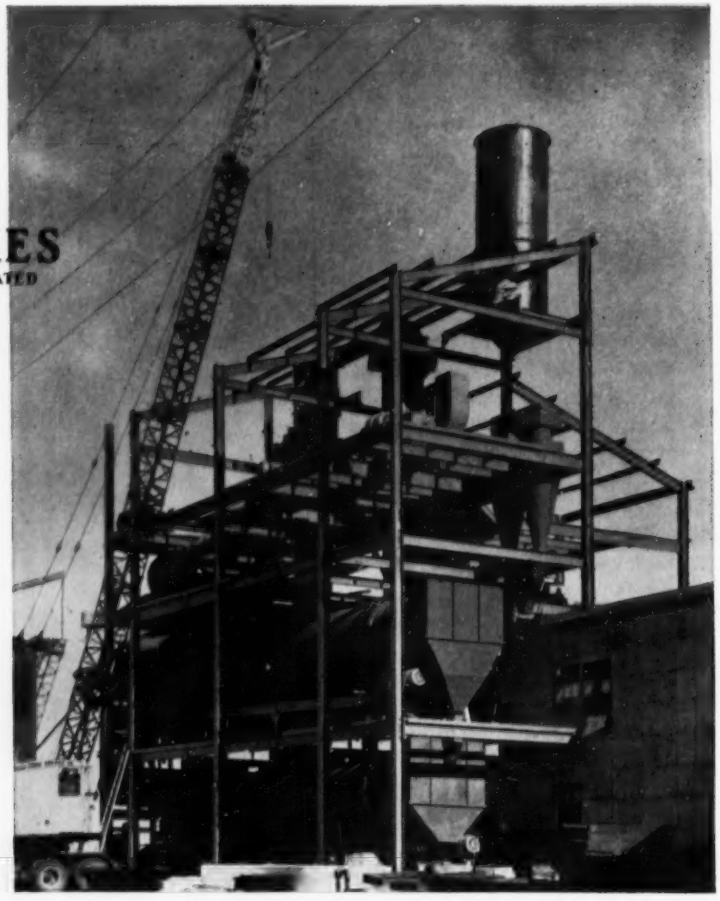
Twenty-three charter members founded the Society on Dec. 31, 1907, at the Botany Department of the University of Chicago. Today the Society has more than 3,300 members in the U. S. and 50 other countries. Fully 75 percent of these professional workers are employed by USDA, land-grant colleges, and other public-supported organizations.

More than 40 percent of the mem-

Concluded on page 23

Fertilizer production unit of Land O'Lakes Creameries' Minneapolis plant, before siding was applied

LAND O'LAKES
CREAMERIES INCORPORATED



from an idea in June to productive operation in January —the Land O'Lakes Fertilizer Plant

In the opinion of several experienced fertilizer producers, time was too short to start from scratch in June 1955 and have a new fertilizer plant in operation to meet the 1956 market demands.

But Land O'Lakes management decided to flash the go ahead sign. In July Blaw-Knox accepted the challenge—to engineer, construct, and install a TVA continuous ammoniation and granulation system in time to produce for the 1956 fertilizer season.

Engineering was well under way in August. Ground broken in September. Structure housed by November. Final installations finished in December. Operation started in early January. Well over 30,000 tons of granular fertilizer produced and sold during spring season of 1956.

That was the tight schedule maintained by Blaw-Knox—in spite of heavy snowfalls and temperatures that dropped at times to 30° below zero.

This was, of course, an unusual assignment. But it demonstrates the ability of Blaw-Knox to handle tough jobs. So when you are considering a modernization, an expansion or a new plant program, we would welcome the opportunity to study your project with you and submit our recommendations.

BLAW-KNOX

BLAW-KNOX COMPANY

Chemical Plants Division • Pittsburgh 22, Pa. • Chicago 1, Ill.

Birmingham • New York • Philadelphia • San Francisco • Washington, D.C.

Designers, engineers and builders of plants for the process industries: chemical • petroleum • petrochemicals • resins and plastics • nuclear energy • fats and oils • fertilizers • synthetic fuels

Arcadian® News

Volume 2 | For Manufacturers of Mixed Fertilizers | Number 9

Nitrogen Division Advertising Helps Sell

MIXED FERTILIZERS

The poster pictured below is the opening gun in the big, powerful 1957-58 advertising campaign now being conducted by Nitrogen Division, Allied Chemical, to help you sell mixed fertilizers. Big posters similar to this in full color are now appearing on hundreds of billboards in leading farming areas.

These posters urge farmers to buy their plant foods in the form of mixed fertilizers. THE BEST FERTILIZERS ARE MIXED FERTILIZERS is the theme of this campaign.

Mixed fertilizers offer many advantages to the farmer. They save time, labor and money and pay big profits on the investment. They overcome the difficulty of using separate materials and lessen the hazard of mis-use. Mixed fertilizers are practical interpretations of official recommendations. The right mixed fertilizer is like a professional prescription to fit the exact needs of the crop and the soil.

Mixed fertilizers are manufactured in many different analyses and combinations of major plant foods plus secondary plant foods and minor elements. Various carriers of plant foods are used to adapt fertilizers to particular needs. All of this represents an enormous savings to the farmer in work, worry and expense.

Mixed fertilizers are farm efficiency in a bag. They help the farmer to make one acre do the work of two or more. They enable him to do the entire job of plant feeding with one trip across his field. Supplemental individual plant foods are needed under certain conditions but for most crops and soils *the best fertilizers are mixed fertilizers.*

Nitrogen Division, Allied Chemical, produces and sells nitrogen. But Nitrogen Division has always aggressively supported the importance of using nitrogen in a balanced fertilizer program. We will keep you posted on our continuing efforts to help you sell mixed fertilizers as this campaign unfolds. In the meantime, we will appreciate your comments and suggestions. Just write: Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y.

Full-color reproductions of this billboard in small size (30 inches long) are available for use as wall posters or window streamers by you and your dealers, without charge or obligation. Just request quantity you desire from Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N.Y.

Arcadian News for Fertilizer Manufacturers . . . . . from NITROGEN DIVISION

TONNAGE OPPORTUNITIES

27 MILLION FALL CUSTOMERS

Get Your Share of this Big Market with Fertilizers Containing N-dure® Solution

A recent survey indicates that home owners—27 million of them—now buy about one 80-pound bag of fertilizer per family per year, out of an annual $30 expenditure for lawn and garden supplies. And their tendency is to use more—when they can get a mixed plant food that is easy to apply, and one that makes grass and gardens thrive through the year on only one or two applications.

Early fall, the time for lawn fertilization, represents an important part of this growing market. It will pay you to get your share of these sales. You can do it with mixed fertilizers containing *enduring* nitrogen. One bag of fertilizer per customer looks like a small sale. If your farm customers each use just one extra bag of fertilizer, you can hardly notice the difference. If the home owners in your market area each use an extra bag of fertilizer, the market is doubled!

Each year more and more home owners are trying to improve their lawns with fertilizer. They may not produce the "show place" of the neighborhood, but they do want their lawn to "look nice." The fertilizer you sell them can do this job easily, when you make mixed fertilizer containing enduring nitrogen.

Home owners want good grass but they won't bother to fertilize turf every few weeks, as golf greenskeepers used to do. But give them mixed fertilizers with enduring nitrogen—fertilizer to spread only twice a year—and they will buy it and spread it.

As you know, specialty fertilizers containing enduring nitrogen are making a big hit with nurserymen, golf clubs, groundskeepers and other large-scale growers of turf and ornamental plants. But the biggest market of all is the home lawn owner. For all these markets, you have a new, easy way to make mixed fertilizers with enduring nitrogen.

Use N-dure Solution

Use N-dure urea-formaldehyde solution and urea in your regular fertilizer-mixing operation. This combination enables you to produce good-condition mixed goods in which the nitrogen as well as the phosphate and potash will feed lawns and plants steadily for months after a single application.

N-dure enables you to make semi-granular, non-segregating, non-burning mixed fertilizers with your present equipment. Nitrogen Division research has shown the way. By using N-dure solution and urea, you produce ureaform nitrogen during the process of manufacturing a chemically-controlled mixed fertilizer. And you produce this lasting, good-condition product at low cost.

Fall is the ideal time to fertilize turf and other ornamentals. The growers of turf grass want fertilizer that they need to apply only once or twice a year. They want fertilizer that doesn't burn plants, that doesn't leach, and that spreads easily without lumps and without dust. You can make it with your standard ammoniating apparatus, in a wide variety of plant food ratios. Now is the time to produce for this profitable fall market!

For full information on how N-dure can help you make money, write to Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y.

Arcadian News for Fertilizer Manufacturers . . . . . from NITROGEN DIVISION

IT PAYS TO CHECK YOUR PLANT OPERATION TO Cut Costs and Improve Output

CALL NITROGEN DIVISION TECHNICAL SERVICE!

Before you settle on your manufacturing procedures for the coming season, it will pay you to double check every method, material and piece of equipment in your plant.

Experience shows that profits often depend on giving careful attention to obvious details as well as the more complex and challenging manufacturing problems. Fertilizer men at a recent meeting were amazed when a badly-corroded mixer pipe, brought in from a plant operated by a member of the group, was displayed to them. The pipe had been used for introducing solutions into a batch mixer. It was so worn that a number of holes had merged and become a wide-open slot that wasted materials and built up hot spots in the mix. A subsequent check at plants represented by men at the meeting showed several more badly corroded pipes in use.

90% of Calls are Helpful

It doesn't take a call from a Nitrogen Division technical service man to find so obvious and simple an operational fault. But nine times out of ten, a technical service call *does* provide some definite improvement—like cutting costs, turning out a higher-quality product, or changing materials to speed and better a mixing operation.

One of the best ways to pare down costs is to use the nitrogen solutions and other ingredients that are specifically adapted to the fertilizers you produce. For example, during one service call that involved checking mixing operations, a manufacturer found he could double his ammoniation rate. Use of a greater amount of *the proper nitrogen solution* was required, and this greatly reduced the cost of nitrogen in the fertilizer.

In another situation, Nitrogen Division technical service helped cut down fumes produced in making a pulverized fertilizer, without reducing use of a volatile solution. Here again, the process was adapted to utilize more of the solution and turn out a better-conditioned product with a lower total cost of meeting nitrogen guarantee.

Nitrogen Division does more than provide the largest complete line of straight nitrogen carriers, including solutions, anhydrous ammonia and dry nitrogen carriers. The organization's hundreds of research and technical men supply a complete working knowledge of best procedures for formulating pulverized or granular goods in all kinds of equipment. They are continuing to develop new materials for improving mixed-goods manufacture. Granular fertilizer manufacture is relatively new, but Nitrogen Division already has a background of 20 years of intensive experience in providing nitrogen materials that simplify production of high-quality granular fertilizers.

Along with the newest materials and methods, Nitrogen Division continues to adapt proved procedures and operating techniques to save on raw material costs, and to improve fertilizer condition. Whether your plant is small or large, whether you use continuous or rotary mixers—or older equipment, Nitrogen Division materials and methods are developed to help you make greater sales and more profits.

Ask the Nitrogen Division technical man to assist you in making a thorough survey of your equipment, your methods of ammoniation and your use of materials. This is a sure way to save on basic operating costs. For skilled, prompt technical service, free to customers, contact Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y.

Proper selection of the correct nitrogen solution can increase your profits

Farm Fertilizer Survey Results

A new and intensive survey to determine motivations that influence farmers' fertilizer buying habits has been recently completed by an independent research organization employed by Nitrogen Division, Allied Chemical, and results are now being compiled.

Based on a major series of scientifically-designed personal interviews conducted on farms during the present growing season, the "depth study" is expected to reveal significant new information never before available to the fertilizer industry.

The survey was constructed to produce an analysis of the many motives and factors that affect a farmer's decisions to buy fertilizers. Statistical data on what growers now buy compared to purchases in previous years is also being tabulated.

Considerable new information is expected to emerge from the survey concerning agricultural areas where fertilizers are used and how they are applied. Other results will correlate farm size and crop patterns with the kinds of plant food purchased.

Watch for further information about results of this important fertilizer survey in future issues of *ARCADIAN® News.*

NITROGEN *plus* SERVICE

There are many reasons why it pays you to deal with Nitrogen Division, Allied Chemical. You are served by America's leading producer of the most complete line of nitrogen products. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions for the fertilizer industry. You are assured of dependable supplies from three huge plants at Hopewell, Ironton, and Omaha. Your nitrogen is delivered to you by the best transportation facilities and equipment. You get technical assistance and formulation advice from the largest and most efficient staff of nitrogen experts. Your sales are supported by the most powerful advertising campaign ever conducted to sell fertilizers. Nitrogen Division is your headquarters for NITROGEN *plus* SERVICE. Look over the big line and contact one of the 14 offices listed below.

Arcadian® Nitrogen Solutions

	CHEMICAL COMPOSITION %					PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Approx. Sp. Grav. at 60° F	Approx. Vap. Press. at 104° F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®								
2	41.0	22.2	65.0	—	12.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	1.147	18	26
3	41.0	26.3	55.5	—	18.2	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	1.188	1	56
4M	41.0	19.0	72.5	—	8.5	1.194	7	61
6	49.0	34.0	60.0	—	6.0	1.052	48	-52
7	45.0	25.3	69.2	—	5.5	1.134	22	1
URANA®								
10	44.4	24.5	56.0	10.0	9.5	1.108	22	-15
11	41.0	19.0	58.0	11.0	12.0	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	1.081	25	- 7
13	49.0	33.0	45.1	13.0	8.9	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	1.052	29	1
U-A-S®								
A	45.4	36.8	—	32.5	30.7	0.925	57	16
B	45.3	30.6	—	43.1	26.3	0.972	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	0.618	211	—

Other ARCADIAN® Nitrogen Products: UREA 45 • A-N-L® Nitrogen Fertilizer
Ammonium Nitrate • American Nitrate of Soda • Sulphate of Ammonia

NITROGEN DIVISION Allied Chemical & Dye Corporation

MAIN OFFICE: 40 Rector Street, New York 6, N. Y., Phone: Hanover 2-7300

Branch Offices	Phone
Hopewell, Va., P. O. Drawer 131	Cedar 9-6301
Ironton, Ohio, P. O. Box 98	Ironton 8-4366
Omaha 7, Neb., P. O. Box 166	Bellevue 1464
Raleigh, N. C., 16 W. Martin St.	Temple 3-2801
Columbia 1, S. C., 1203 Gervais St.	Columbia 3-6676
Atlanta 3, Ga., 127 Peachtree St., N. E.	Jackson 2-7805
Memphis 9, Tenn., 1929-B South 3rd St.	Whitehall 8-2692
Columbia, Mo., P. O. Box 188	Gibson 2-4040
Indianapolis 20, Ind., 6060 College Ave.	Clifford 5-5443
Kalamazoo, Mich., P. O. Box 869	Kalamazoo 5-8676
St. Paul 4, Minn., 45 N. Snelling Ave.	Midway 5-2864
Los Angeles 5, Cal., 2999 West 6th St.	Dunkirk 8-3201
San Francisco 4, Cal., 235 Montgomery St.	Yukon 2-6840

ASA *Continued from page 16*

bership attends each annual meeting, and a total of over 1,500 members and guests is expected for the Atlanta sessions. W. M. Myers of the University of Minnesota is general program chairman, with M. G. Weiss, USDA, and G. B. Bodman, University of California, as co-chairmen for the crops and soils programs, respectively. A. G. Norman of the University of Michigan will preside at the opening sessions of the Golden Jubilee event.

H. H. Kramer of Purdue University is president of the Crop Science Society of America, and L. B. Nelson of the USDA Agricultural Research Service is president of the Soil Science Society of America. These member societies, together with an Agronomic Education Division, make up the American Society of Agronomy.

Schultz is First President Of New Pennsylvania PFES

Arthur A. Schultz, president of Reading Bone Fertilizer Co., was elected president of the newly-formed Pennsylvania Plant Food Educational Society, organized during the State fertilizer and lime conference held at Pennsylvania State University.

The new organization is a non-profit corporation, designed to "foster and promote useful and practical information regarding all forms of plant food, soil amendments and their use on crops, better cultural practices and related information."

Other officers elected were Howard B. Sprague, head, Department of Agronomy, Penn State, vice president; and Roger C. Smith, Eastern States Farmers' Exchange, secretary-treasurer.

Directors elected to serve until January next year were Smith; Sam S. Thornton, F. S. Royster Guano Co.; David Shroyer, H. E. Millard Lime and Stone Co.; Leland H. Bull, deputy secretary of agriculture in Pennsylvania; Clarence A. Reichard, Robert A. Reichard, Inc.; and E. T. York, American Potash Institute.

Directors named to serve until January, 1959—in addition to Messrs. Schultz and Sprague—are: Herbert R. Albrecht, director of agricultural and home economics extension in Pennsylvania; Perry Onstot, Davison Chemical Co., Division of W. R. Grace & Co.; and George H. Serviss, G. L. F. Soil Building Service, a Division of Coop. G. L. F. Exchange, Inc.

Status of FOREST TREE FERTILIZATION

National Plant Food Institute's Research and Education Committee has published a 39-page report of abstracts and a general summary on the current status of information on Forest Tree Fertilization. This article is drawn from that report, prepared by a special NPFI task force; Borden S. Chronister was chairman, with W. F. Nichols and E. T. York, Jr., also serving on the group. Copies of the complete report are available from W. H. Garman, secretary of NPFI's Research and Education Committee, 1700 K St., Washington 6, D. C.

In recent months there has been a growing interest throughout the United States in the possibility of the use of fertilizers in forest management. This interest has stemmed, in part, from observations of response by various species of trees to additions of plant food. This evidence of response has, in turn, suggested possible means of increasing the productivity of our forest lands.

As a nation, our timber needs are continually increasing. The U. S. Forest Service estimates that by 1975 we shall need from 30-40% more timber products than we did in 1952. By the year 2000, our timber requirements are expected to be from 70-110% greater than the present. It is obvious, therefore, that during the next several decades efforts must be directed towards increasing the productivity of our forests. Certainly we shall need to know what role fertilizers may be able to play in helping meet these needs.

Research with both coniferous and deciduous species has in some instances revealed no fertilizer response; in other situations, response has been obtained to applications of complete fertilizers or to some specific nutrient. The failure to obtain uniform response patterns, however, should not be surprising at this stage in the development of the problem. Indeed, it would be even more surprising if there had been a uniform and consistent response to fertilization.

Experience in the fertilization of other crops has demonstrated marked differences in the fertility levels of soils and in the nutrient needs of different plant species. The limited fertility research with trees is apparently reflecting these differences without going sufficiently far, in most cases, to explain or define them. In many instances, experiments have been conducted to test the response to a single nutrient without eliminating other factors which could limit or prevent a response to the specific nutrient being tested. These comments are in no way critical of what has been done. The dearth of information merely emphasizes the fact that forest fertilization is very much in its infancy in this country and points out the need for expanded research to provide more of the answers.

Recent contacts with forestry schools and large wood-producing companies throughout the country indicate a growing interest in forest fertilization as evidenced by plans for expanded research in this field. In years to come, we may expect this research to provide many of the answers needed to guide the development of this phase of forestry management. While current information may suggest possible opportunities or future trends, it fails to provide a basis for many conclusive recommendations relative to fertilizer usage in forestry.

Fertilizers have been suggested for use in three different phases of forest management: (1) In nurseries; (2) In seed production; (3) In wood production.

Nurseries

Several factors point to a rather general need for the use of fertilizers in the management of forest nurseries. Certain work has indicated that the total annual removal of nutrients by seedlings in the nursery was comparable to the annual demands of ordinary field crops. This is brought out specifically in research showing that a crop of two-year-old white pines in the nursery removed approximately 95 lb. of N, 32 lb. P_2O_5, and 42 lb. K_2O per acre. The amount and ratio of nutrients needed would, of course, vary with the level of fertility in the soil and the species of trees.

German workers have reported increased nursery yields of 100-400% from the use of fertilizers. Research in this country has suggested some very valuable benefits from the use of certain nutrients in nursery culture. Potash, for example, has been found to increase the frost and drought resistance of young seedlings, which, in turn, contributed to a greater survival of field-planted stocks.

With the intensive culture associciated with seedling production, there appears to be little question of the general need for fertilizer usage in nursery management. This is particularly true in the light of the relatively small areas and low cost involved.

Seed Production

There is considerable evidence that fertilizers will tend to stimulate seed production. Most of the work has been done with conifers although there is also evidence of an increased seed production resulting from fertilization with a number of the hardwoods as well. While such a practice may serve a very useful purpose in reforestation, it would be relatively insignificant in terms of fertilizer usage.

Wood Production

The real potential market (if any) for fertilizers in forestry would lie in wood production. Basically, there are two factors which will govern

the development of such a market: (1) There must be conditions under which trees will respond in growth or dry matter production to additions of plant food; (2) This response must be of sufficient magnitude to be economically feasible to justify the use of fertilizers.

Already we have a partial answer to the first question. We know there are many conditions under which trees will respond to the application of fertilizers. However, there is evidence of many conditions under which a response is not obtained. The big problem is to be able to **predict** the conditions under which a response may be expected. Undoubtedly, soil testing and leaf analyses can play very useful roles in this regard. Leaf analysis, in particular, would appear to be a most helpful tool in determining when the level of nutrients in a tree had reached a critically low point. Much research is needed, however, to establish procedures in sampling and to determine what the critical levels are for various species of trees.

Dr. S. A. Wilde, professor of forest soils at the University of Wisconsin, has suggested several soil types "under which a satisfactory response of forest stands to fertilizer treatments may be particularly expected: (1) Depleted soils of any textural composition located in humid regions, especially those with a long-growing season; (2) Sandy soils underlain by ground water whose normal summer level occurs between three and five feet; (3) Substrata of artificially drained and burned-out peat, provided the ground water table is at a sufficient depth; (4) Fine-textured soils derived from purely siliceous parent material, such as quartzite and siliceous shales; (5) Eroded fine-textured soils which prior to afforestation lost their humus-enriched surface layer; (6) Severely burned podzol soils; (7) Soils covered with a layer of inert raw humus whose insufficiently rapid decomposition prevents the release of available nutrients."

Professor Wilde continues: "The soils in these categories occupy an enormous area in the United States. A considerable portion of them is now supporting struggling forest plantation and "off-site" second growth stands that are devouring progressively mounting current expenses. As often as not, this drain of funds proceeds in a manner concealed from the owner of the forest property. A skillful application of fertilizers could remove many of these stands from the class of liabilities."

It should be emphasized that the problem is not nearly so simple as merely to determine whether a tree will respond to fertilization. We must also determine when, in the life of a tree, such a response is greatest, how frequently applications must be made, and what method of application is most effective, as well as the amounts, ratio, and forms of nutrients. All of these factors are extremely important and may govern to a large measure the magnitude of the response.

There is evidence that fertilizers have failed to be effective in certain situations because they tended to stimulate weeds and undesirable forest species which, in turn, competed with the trees for moisture, light, etc. Without question, competition is an important factor in young stands, and research is needed to develop means of overcoming this difficulty. Deep, localized placement of the fertilizers at the time trees are planted would appear to be helpful in this regard. Furthermore, it may be feasible to use chemicals to control weeds for a period to allow the young trees to get ahead in growth.

As the trees become large enough to shade the ground and render competition less of a factor, the mechanics of applying the fertilizer becomes a greater problem. In recent years the airplane has been used quite successfully for the application of chemicals, including fertilizers, to crops, and it would now appear that aerial topdressing of fertilizers in forests would be a feasible operation.

While it is evident that trees may respond to fertilizers and that suitable application methods may be developed, the big question is whether the response will be economical. There is very little information to serve as a guide in this regard. The relatively low value (on an annual basis) and the long-term nature of the crop mean that the expenditures for fertilizers must be kept relatively low or the returns therefrom must be reasonably large. The forest manager will also have to weigh the possible returns from a given amount of money used for fertilizer with those involving the same amount spent for additional land, insecticides, or other management practices aimed at increasing total production.

Although the use of fertilizers in forest management must ultimately depend upon the economics involved, many factors will be difficult to evaluate. For example, if through fertilization a stand of wood could be cut in fifteen years instead of twenty, the fire hazard would be reduced by ¼—a factor of real significance but difficult to assess in monetary terms.

Future changes in price of wood and wood products might influence greatly the feasibility of fertilizer use. Fertilizers could be applied 5 to 40 years before the crop is harvested. What might not have been a profitable practice based on prices at the time of application might pay well by the time the crop is sold—or vice versa.

These and many other factors emphasize the fact that the problems of forestry fertilization are, in many respects, far more complex than those of other crops. This makes even more critical the need for thorough, reliable research information to guide forest managers in arriving at decisions relative to fertilizer usage.

Summary

There is a growing interest in the possibilities of the use of fertilizers in forest management. This interest is motivated, in part, by the realization of the growing need for forest products and by observations that wood production may, in certain instances, be increased through the use of fertilizers.

A review of the literature indicates three specific uses of fertilizers in forest management: (1) In nurseries; (2) To increase seed production; (3) To increase wood production.

A number of instances are reported in which seed production of both evergreens and hardwoods has been greatly stimulated by fertilization. There is likewise evidence that fertilizers are needed quite generally in nursery culture.

The evidence of fertilizer response by forest trees is not too conclusive. The amount of work on the subject, however, has been quite limited. With the information available, there is sufficient indication of nutrient deficiencies to suggest that conditions under which responses could be expected may be extensive. There is a very critical need for more research to define these areas or conditions under which responses may be expected.

Even when trees are found to respond to fertilizers, the ultimate question is whether or not the response is great enough to give an

economical return. Many factors must be considered in arriving at such a decision. There are many localized situations where research has shown trees to give marked responses to the application of plant food. In such situations, there is little question about the economic feasibility of such an application. At the present time, however, the need for fertilizers has not been demonstrated on the major portion of our forest land. We might add that likewise there has been little evidence to show that fertilizers are **not** needed on these lands.

The limited information available suggest that forestry may, indeed, represent a large potential market for the fertilizer industry. However, extensive fertilizer usage in forestry must await the development of information indicating the nature of the response which can be expected therefrom. When such information is available, we shall then be in a better position to evaluate the economic feasibility of fertilizers on the bulk of our forest land.

FERTILIZING *Southern Pines*

by LAURENCE C. WALKER
University of Georgia
School of Forestry

"Shootin' the bull" in a session on the economics of practicing forestry evoked the comment from H. C. Mitchell that the landowner has to learn he can't put land through a sawmill. Besides the dirt clogging up the gears, sand particles dull the blades. Sawmills were built for logs alone.

In less sarcastic terms, this is to say that growing trees on poor land, even when managed well, is an inefficient way to product wood. Yet, too often the best land a man has available for a tree crop is poor land. Government agencies have vast acreage of low grade land too, which, for the humane purpose of water and soil conservation, should be returned to forest. This may be the case, even if it is not economically sound at the present time to do so.

Forest fertilization trials have been undertaken around the country to explore the possibility of increasing production on depleted soils. Some of these are noteworthy in a particular way. In New Jersey, aerial applications of complete fertilizer have been made; in New York, the dramatic response to potash fertilization of red and white pine and the spruces on "abandoned" deep sands made forest history, as did the correction of chloroses with magnesium applications; in Florida, gum yields for naval stores increased; in California and Alabama, Douglas fir and longleaf pine seed production has been stimulated.

A recently initiated project in Georgia has its marks of distinction likewise. One of these is cooperation. A county agent in the Piedmont worked up the interest. He and an extension forester arranged for the use of industrial land and gratis fertilizer procurement from three manufacturers. A University of Georgia research forest designed the experiment, and a University soils scientist ran pretreatment analysis. The Georgia Forest Research Council contributed travel expenses and fence posts. Planting was done by labor and supervision furnished by a pulp and paper manufacturer.

The trees are the second special feature of this project. Furnished by geneticists of the University of Georgia's School of Forestry, each of the twelve hundred seedlings in the net or measurement plots of the experiment are from the same parent tree (see photo). The tree geneticists harvested the seed and produced the trees in the school nursery for this fertilization study. Using progeny from a single parent is an attempt to minimize the variation which occurs among seedlings. Thus, the primary differences in growth may be attributed to fertilizer treatment. Before long these scientists hope to have available for future experiments seedlings grown from control-pollinated seed. This will reduce the range of inherited variation still further. At the same time, they are working on vegetative propagation which, for many types of tree-growth studies, will practically eliminate genetic variation since all offspring produced from cuttings from a single tree have identical genic constitution. It is hoped that by the time this technique is available, fertilizer research in southern pines will be ready to go into high gear.

Fertility experiments of southern pines are tragically behind schedule. Perhaps the statement attributed to an early-day and eminent botanist was partly responsible. While I cannot find his words to quote, I have heard it told many times how Professor James Toumey is reputed to have admonished his classes at Yale, not long after the turn of the century, to this effect: If you give me a bed of marbles and the proper water supply, I can grow southern pines. As one can determine from his writing, Professor Toumey's thinking forty years ago was way ahead of the times in many areas of forestry philosophy. However, it seems the door to fertilizing southern pines was closed due to the repetition of that one statement down through the years. Certainly this early advocate of plantation establishment would not have wanted it this way. Fertilizing southern pines as a management practice was subsequently guffawed by others; some, perhaps, with justification. At any rate, almost no research in fertilizing southern pines for growth stimulation has been undertaken.

Now we must determine the effectiveness of fertilizer applications. As Philip Wakeley says in his now famous monograph, **Planting the Southern Pines**, "There has been much speculation about the desirability of fertilizing the planting, but few reports of its effect on initial survival." And, with but one exception, these reports have dealt with species other than southern conifers. Ironically, the excepted case—a shortleaf fertilization—was in Ohio, hardly typical of the South. Unfortunately, that experiment in 1941 showed no evidence of fertilizer stimulation the first two years. Perhaps the chemical, applied in mattock holes, burned seedling roots or increased weed competition for the available moisture supply at the base of the seedlings to too great an extent to accommodate both weeds and pines.

While the economics of fertilizing southern pines may be questionable today, the situation is expected to be otherwise in 1967. Stumpage prices for pulpwood—the farmer's short-term forest crop—will con-

Parent trees make a difference in seedling vigor. James Greene, tree geneticist at the University of Georgia School of Forestry, exhibits the similar height growth in the nursery bed of stock from each of two parents, and the dissimilarity of progeny between parents.

tinue to rise. We must know the effectiveness beforehand; with typical American ingenuity we can forecast that the cost of application will fall into line. Money-wise, pine tree fertilization may be thought of this way: A price of five dollars per cord is paid a farmer for pulpwood on the stump. On better-than-average abandoned land, he will be able to harvest about 25 cords per acre in 30 years. If with a single fertilizer application costing $10 per acre he could increase growth two cords per acre over the 30-year period, he would break even. All growth over two cords would be profit. In addition, the anticipated higher stumpage value would be profit.

Taking into account that an average of 150,000 acres of agricultural land has been abandoned each year in Georgia alone for the past eighteen years, and either left to go naturally into forest or planted with pines, the potential for forest fertilization comes into focus. It is largely because these lands were depleted of natural fertility to the point where commercial fertilization would not economically replenish the essential nutrients to a satisfactory degree that abandonment took place.

The potential for forest fertilizing can be equally emphasized from the dollar-sign standpoint. The value of woodland crops in Georgia approaches $200,000,000 per year. A considerable amount of this must accrue to abandoned lands now in trees since two-thirds of Georgia's forests are owned by farmers.

The rather modest beginning in the Piedmont of Georgia mentioned above is a test of five combinations on Cecil clay loam soil, a typical series and texture class of the area. All of the **A** horizon has been lost to erosion, and the area had been agriculturally abandoned several years before. Pre-treatment analysis of the plots gave the following data: pH: 6; phosphorus: trace; potash: 100 pounds per acre; lime: 1000 pounds per acre. Obviously, the area had been heavily limed a few years preceding abandonment.

Experiments on this land are testing high and low nitrogen, phosphorus, and complete fertilizer rates, trace minerals lime, and combinations of these treatments.

Silviculturists in the South are particularly interested in the competitive effects of herbaceous weeds for soil moisture in fertilized stands. The fear that increased growth of ground cover will appreciably limit available soil moisture applies for all four prominent species. It is also true for the heavy soils of the Piedmont as well as the sands of the Coastal Plain. However, if the demand for forest products continues at its present rate, using weed killers on herbs in pine plantations shall not be an unfounded dream. After all,

> The worth of a thing
> Is the price it brings.

POTENTIAL FERTILIZER USE BY THE FOREST INDUSTRY

by S. P. Gessel*
University of Washington

The forest industry has and is undergoing the change from a mining operation to one of resource management. Forest product and forest land values have increased markedly making for the possibility of intensive forest management. Pulp production has also become an important part of the Northwest forest economy.

These forces have all brought about the philosophy of producing the most on each acre of forest land. This has concentrated thought on factors affecting growth of forest trees. The role of the soil in supplying nutrient needs of forest trees has been recently emphasized and the fact that some Northwest forest soils are deficient in this supplying ability has been shown.

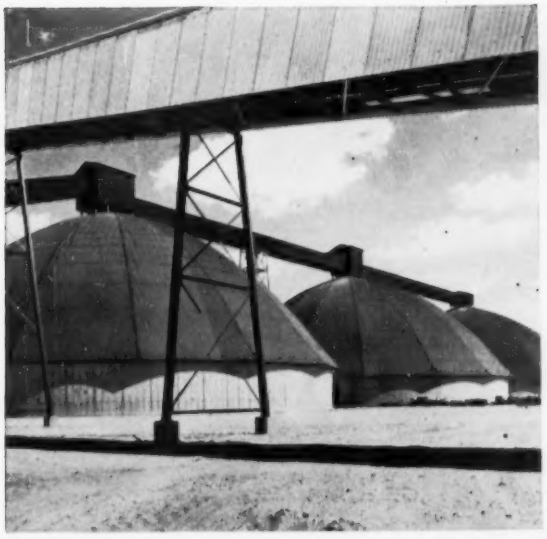
This work, in conjunction with similar work in other parts of the U. S. and the world, has indicated that foresters need to give serious consideration to fertilization of forest land.

A survey of work indicates that fertilizers have: increased height and diameter growth and hence wood volume; shortened time to mature crop; increased resistance of trees to certain infestations; increased seed production; improved growth of planted stock; improved quality of nursery stock; improved undesirable forest soil conditions.

The total area of land needing some form of treatment is large. The individual holdings are also large.

The necessary information to carry out a program of fertilization is very meager. Foresters will not be sold on easy-quick cures. A great deal of good research work must be done on our soils and forests before any program can function successfully. The wrong approach and overselling with wrong treatments will quickly kill the potential.

* *At Pacific Northwest Fertilizer Conference, June 26.*



GREATER YIELDS for FERTILIZER MANUFACTURERS and FARMERS

NATIONAL POTASH supplies the fertilizer manufacturer with coarse and standard grade muriate of potash that is dust-free, free-flowing and of uniform K_2O content.

These qualities enable the manufacturer to offer a better product to the farmer for his plant food dollar.

NATIONAL POTASH COMPANY
205 EAST 42nd ST. • NEW YORK 17, N. Y.

PHOSPHATIC ACID SOLUTION FROM NEW PLANT CUTS COST OF MAKING FERTILIZERS

Many fertilizer manufacturers can now cut their costs by formulating with Phosphatic Fertilizer Solution (wet-process phosphoric acid). Use of this chemical from U.S.I.'s new plant will, in many cases, enable you to produce standard or special granular formulas at lower cost. It will also allow you to make higher analysis grades of fertilizer. To help you determine if and how you can profit by using phosphoric, the U.S.I. Technical Service Engineers are ready to work with you.

And you can be assured of a steady supply of this basic fertilizer material . . . because the entire production of Phosphatic Fertilizer Solution at the new U.S.I. plant at Tuscola, Illinois, is available for non-captive commercial uses. This amounts to 30,000 tons of P_2O_5 per year.

You can, in fact, get *all* of the following fertilizer basics in addition to PFS on *short notice locally* from U.S.I: Anhydrous and Aqua Ammonia . . . Ammonium Nitrate . . . Nitrogen Solutions . . . Sulfuric Acid . . . and Nitric Acid.

CALL IN THE U.S.I. MAN NOW

May we suggest that you get in touch with your U.S.I. man. Let him work out optimum formulations with you. He's experienced in determining the factors that make up formula cost. He will also be glad to assist you during your trial runs.

If your costs can be lowered by using PFS (and they probably can) he'll be able to help you find out. Quickly. Reliably.

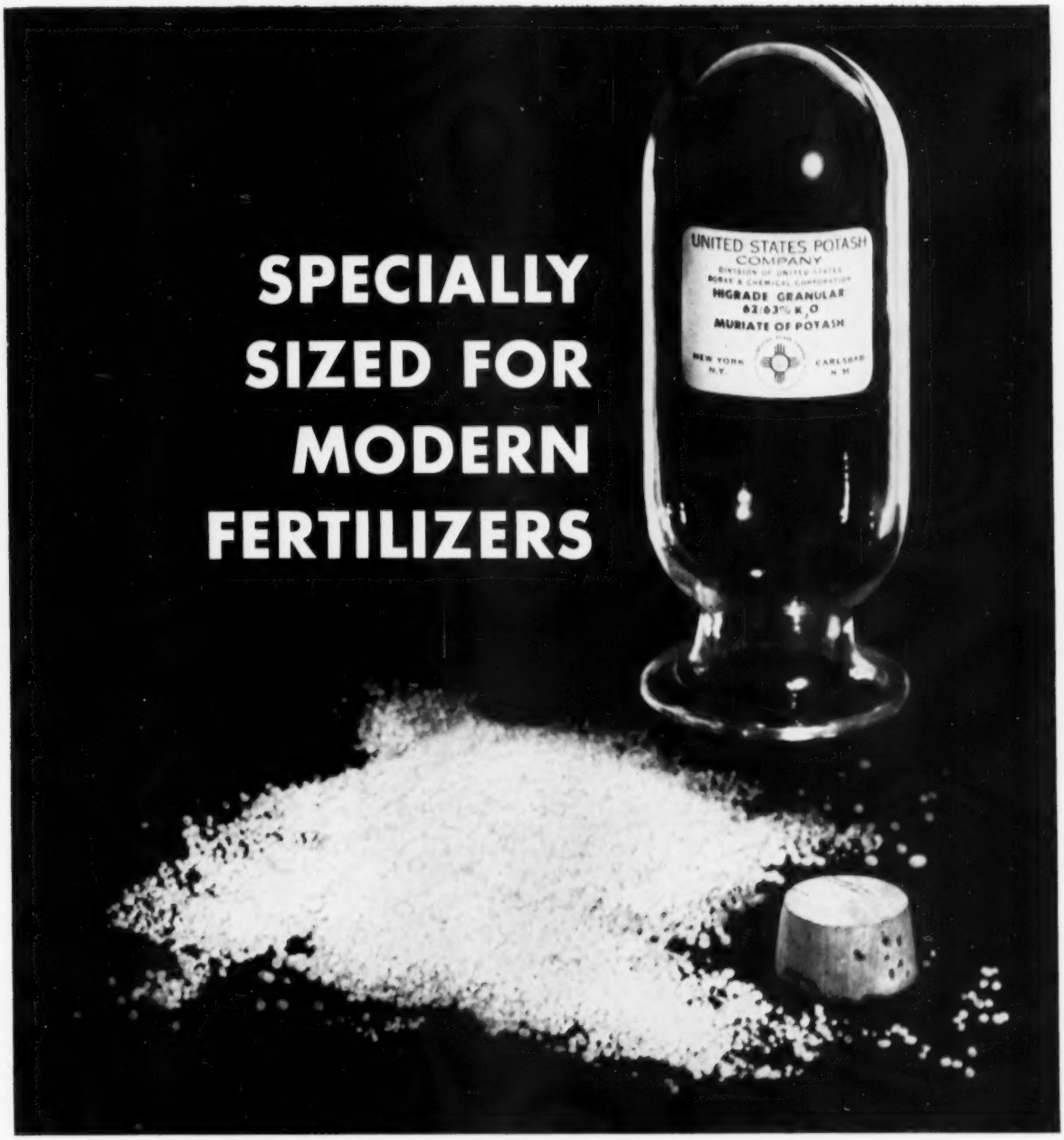
If you would like the U.S.I. man to work with you, write to us—or better still telephone collect.

HEAVY CHEMICAL SALES

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers and Chemical Corporation

99 Park Avenue, New York 16, N. Y.



USP'S NEW HIGRAN

USP announces the FIRST Higrade Granular muriate of potash designed specifically for the manufacture of today's modern fertilizers. Its perfect whiteness attests to its purity—the highest now available in granular agricultural muriate of potash. Non-caking and free-flowing throughout, USP's new Higrade Granular potash contains 62/63% K_2O! A regular supply of this important new potash product is immediately available from the U.S. Potash Co.

USP also offers Higrade muriate of potash—62/63% K_2O and Granular muriate of potash—60% K_2O—both free-flowing and non-caking.

UNITED STATES POTASH COMPANY
DIVISION OF UNITED STATES BORAX & CHEMICAL CORPORATION
50 Rockefeller Plaza, New York 20, New York
Southern Sales Office: Rhodes-Haverty Building, Atlanta, Georgia

REG. U.S. PAT. OFF.

When you mix MINOR ELEMENTS and PESTICIDES into Fertilizers WHAT HAPPENS?

by C. E. Floyd*
Director of Chemical Control
Virginia-Carolina Chemical Corp.

There is no doubt in my mind that the inclusion of minor elements in fertilizers will increase tremendously within the next few years. The increase in the actual additions of minor elements will no doubt be accentuated as we go into high analysis, pure chemical mixtures. In past years, and to some extent in present formulations, some of the minor elements have been and are supplied in limited quantities as trace elements in basic fertilizer materials. As we progress into the pure chemical mixtures and as agronomists learn more and more about the actual needs of various plants and crops with regard to minor element take-up and functions in plant growth, naturally our problems in the fertilizer game will be multiplied.

I understand that at the present time most interest in this area involves the need for boron for a number of the legumes as well as for a number of vegetable crops. Of equal interest, we believe, is the need for zinc by one of the major crops; namely, corn.

We have never, to my knowledge, experienced any difficulty in making fertilizer mixtures containing boron. In fact, borax seems to improve the mechanical condition of fertilizers. Colemanite and fritted materials have not, as yet, shown any evidence of affecting the condition of our fertilizer mixtures. Our principal concern is insurance of a uniform mixture of the small poundage of minor element material with the large poundage of fertilizer base.

While most of the minor element materials can be introduced in the original or primary basing operation, this appears impractical because of the variable recommendations as to percentage of the minor element required. For example, we understand that zinc sulphate recommendations vary from as low as 10 pounds to as high as 80 pounds, and in some extreme cases even more per ton of fertilizer.

As you can readily understand, storage facilities limit the number of mixtures we can make at the primary basing machine. The simplest manner in which to add the minor element materials is through a formulation machine at the time of shipment. A so-called "buyer's mixture," for example: 1950 pounds of 4-12-12 and 50 pounds of zinc sulphate, weighed and screened into an efficient mixer, thoroughly mixed and discharged into the bagging hopper, is the simplest operation. This is done in some states where buyer's mixtures are allowed. If full analysis is required, then we have to over-formulate our bases so that the dilution of the fertilizer with the minor element material will not drop the major plant foods below guarantee.

As stated before, thorough mixing of the base with the minor element material is of paramount importance. The mixture should be retained in the average fertilizer mixer for at least two minutes; preferably three minutes. The average fertilizer mixer revolves at the rate of 12 to 18 revolutions per minute and our experience is that 25 to 30 revolutions will effect a very good mixture in most cases. In making granular fertilizers containing minor elements, the minor element materials should be introduced in the primary basing operation.

Minor element materials in the form of sulphates, when introduced in excess of 50 pounds per ton of fertilizer, may cause a set of hardening of the fertilizer in the bag. Very dry, well conditioned bases, as well as dry minor element sulphates, will minimize this tendency to "set."

Now, we come to the subject of pesticide-fertilizer mixtures. Let us say at the outset that this is one development in the fertilizer game which we do not like. In the first place, insecticides and fertilizers are controlled by entirely separate sets of laws and in our opinion should be kept apart. There are far more reasons why these materials should not be mixed than the one reason, namely, economics of distribution, justifies. I, for one, do not think that we know enough about the hazards involved, nor the residual effects, to jump into a program of this nature. Perhaps, in a manner of speaking, we are diving into a concrete swimming pool before filling it with water. However, we have been forced into the game, and we will give you the benefit of our experience up to this time.

We have made mixtures of fertilizer and the chlorinated hydrocarbon type of pesticides such as Chlordane, Aldrin, Heptachlor, and Dieldrin, with Chlordane and Aldrin being predominant up to the present time. In the case of mixtures with so-called fine ground fertilizers, we have used a 30-60 mesh granulated pesticide of 25% to 40% purity. This type of solid tends to mix well with a minimum amount of dusting, and, therefore, a minimum hazard insofar as intake by breathing or absorption into the skin is concerned. Even so, operators handling the pesticide, as well as operators at the bagging spout, should use rubber gloves, cotton cover-alls, and suitable respirators.

In some areas we make granular fertilizers and it is obvious that a 30-60 mest pesticide will not mix well with a 5-20 mesh fertilizer, therefore we have adopted a spray application. Usually the pesticide is dissolved in a solvent such as xylene, at the rate of 3⅓ pounds of technical pesticide to one gallon of solvent. We have installed hoppers, feeders, and belts so that we can control the volume of fertilizer on

*From a talk on "Manufacturing Problems With Fertilizer Containing Minor Elements and Pesticides" presented to the 1957 Fertilizer Conference at Alabama Polytechnic Institute, Auburn, Alabama.

the belt, then several very fine spray nozzles are set to control the quantity of pesticide solution to be sprayed on the fertilizer as it moves on the belt. Stirrers are placed between sprays so as to turn the fertilizer over and thereby promote good distribution of the liquid into the solid. Up to about 4 gallons of these liquid carriers per ton of fertilizer can be used without seriously affecting the condition of the fertilizer. In my opinion we could get better distribution of the pesticide if we adopted the liquid type carrier for mixture with the fine type fertilizers in the mixer, The liquid could be applied under high pressure on the rolling bed of fertilizer and should be uniformly absorbed; however, some explosion hazard would have to be reckoned with in such an operation.

We have experienced no added condition problems due to mixing fertilizer with pesticides; however, our experience is somewhat limited and we should watch this angle with due diligence. We have heard of bag spotting when the liquid type of pesticide was used; however, this could have been due to unequal distribution of the pesticide in the fertilizer base. In excess quantities the volatile solvent could very well be responsible for this condition.

We have adopted a policy that in no case would the pesticides be introduced in the primary basing operation where chemical reaction heat is involved. We understand that there is a definite breakdown of most of these pesticides at about 150° F. It is preferable to maintain a pile temperature of less than 100° F. in all fertilizer-pesticide mixtures —this will insure the carrying qualities of the pesticide. So far we have found no appreciable loss of analysis in pesticide-fertilizer mixtures, though we are not too sure that the methods of analysis so far developed are 100% accurate.

It has been suggested that I say something about the control of the Argentine and related species of fire ants. We believe that broadcast application of a pesticide-fertilizer mixture is the most effective manner in which to fight this particular pest. We also believe that USDA has found Dieldrin most effective; however, Heptachlor is very good and somewhat more economical in cost. Both of these pesticides are quite stable and will effect a kill over a longer period of time than do the less stable types of the chlorinated hydrocarbons.

The Executive Committee of the Fertilizer Section of the National Safety Council which met June 7 in Richmond, to discuss ways and means to continue the high level of accident and fire prevention activities of the section, will meet again with the Fertilizer Safety Section at the National Safety Council's annual meeting to be held in Chicago October 21-22 at the LaSalle Hotel. Shown are: Seated left to right: Ansell L. Raney, Phillips Chemical Co.; Dave Anstine, safety director, Phillips Chemical Co.; Tom Clarke, controller, G.L.F. Soil Building Service; John Kato, National Safety Council; George L. Pelton, personnel mgr., The Smith Agricultural Chemical Co.; E. O. Burroughs, Jr., mgr., Insurance Department, F. S. Royster Guano Co., George L. Dietz, safety director, Fertilizer Mfg. Cooperative, Inc.; Mike Ellison, safety director, Mississippi Chemical Co.; S. Cottrell, director of operations, Olin-Mathieson Chemical Corp.; Vernon Gornto, formerly manager, Insurance Department, Smith-Douglass Co. (now heads Insurance Unlimited, Norfolk); O. E. Perry, superintendent, C. O. Smith Guano Co. Standing, left to right: Wayne High, manager of operations, The Baugh Chemical Co.; Elmer Perrine, technical representative, Allied Chemical & Dye Corp.; Grayson Morris, asst. production mgr., Southern States Cooperative; Jean R. Terry, personnel safety eng., Davison Chemical Corp.; John S. Mark, production Mgr., Farm Bureau Co-op. Assn.; R. E. Kelly, Swift & Co.; Curtis A. Cox, asst. mgr., Manufacturing Dept., Virginia-Carolina Chemical Corp.; W. C. Creel, safety director, North Carolina, Dept. of Labor.

Ammonium Nitrate As Blasting Agent

Use of ammonium nitrate fertilizer as a blasting agent (on which your editors have reported from time to time during recent months) is well beyond the field test stage and has become standard with many heavy construction contractors, quarry men and strip coal mine operators, according to Tom K. Smith Jr., director of marketing for Monsanto Chemical Company's Inorganic Chemicals Division.

"This comparatively new method of open air or surface blasting has three major factors which contribute to its growing popularity," he pointed out. "It is extremely safe, it can be controlled by experienced powder men, and it is far cheaper than conventional blasting agents."

Ammonium nitrate fertilizer remains fertilizer until it is poured into blasting holes on the job, Mr. Smith stated. There three conditions must prevail before it becomes an explosive: it must be mixed with the correct amount of fuel oil, it must be confined, and it must be detonated by a charge of dynamite.

Because the "powder factor"—ratio of pounds of blasting agent to cubic yards of material to be blasted —is the same for ammonium nitrate fertilizer as it is for conventional blasting agents, powder men find the change to the new method of blasting an easy one, he pointed out.

"Years of experience have taught good powder men how to control a blast to attain almost any desired result," Mr. Smith said. "They have found that they can control ammonium nitrate fertilizer just as easily as they can control conventional blasting agents."

Using ammonium nitrate fertilizer as a blasting agent in place of conventional materials can be done at a saving of one-half or more for a given job, he estimated, as ammonium nitrate fertilizer costs three and one-half cents a pound while conventional blasting agents cost from eight cents per pound upward.

Monsanto, a large supplier of ammonium nitrate to the fertilizer manufacturing industry, has studied this new application for some time. The company's technical men, working in the field on actual blasting operations under various conditions, have helped develop procedures for obtaining optimum results.

In addition to being used in strip mines, general blasting operations and quarries in this country, ammonium nitrate fertilizer is being used for blasting in many foreign countries, Mr. Smith revealed. It is being used successfully in earth, sandstone, shale, slate, dolomite, limestone, basalt, granite and taconite.

Reviving The Productivity of Mountain Meadows

Careful management of western mountain meadowlands can make them even more productive for the modern rancher than they were for pioneer cattlemen, the U. S. Department of Agriculture reports.

Seven years of research on high-elevation meadows in Colorado show that controlled irrigation in combination with timed harvests and the use of fertilizer will nearly double beef production. The research has been done by USDA's Agricultural Research Service in cooperation with the Colorado Agricultural Experiment Station, ranch groups, and fertilizer interests. The studies were undertaken because hay yield and quality in these meadows had begun to decline.

The tests show that as management practices are improved, the yield and quality of mountain meadow forage improves and, in turn, meat production efficiency is increased. These are significant findings when it is recalled that there are 3½ million acres of meadowland at 6,000-9,000 feet above sea level in 11 western States (Colorado, Wyoming, Montana, Idaho, Utah, Washington, Oregon, California, Nevada, Arizona and New Mexico) and they are key resources for ranchers. Traditionally, they supply hay for winter feeding and early spring pasture until grazing lands at higher altitudes are snow-free.

Beef feeding tests showed that over a four-year period an untreated grass-legume meadow produced only 358 pounds of meat compared to 627 pounds from a grass forage meadow treated with nitrogen.

Another summary of research results showed that under ordinary ranch practice 4 acres are needed to produce a 490-pound weaner calf. However, a 570-pound weaner calf could be produced on 1.56 acres of mountain meadow that had received no soil treatment other than water control; and an animal of the same weight could be produced on only .87 acre of nitrogen-treated soil with water control.

Intermittent, rather than continuous, irrigation will produce more abundant hay stands, the study showed. The change to intermittent irrigation resulted in an increase in forage—from 1 ton of sedge-rush hay per acre to 3.5 tons of tame-grass legume forage per acre. Liberal nitrogen treatment along with the intermittent irrigation eliminates the legumes and increases the yield to as high as 5.5 tons per acre.

Analysis of the hay indicated that it has a much higher protein content when two cuttings are made rather than a single late harvest. Crude protein content totaled only 5 percent in late-cut forage compared with 11 percent in early cut hay. Intermittent irrigation and two harvests yielded 1,200 pounds of crude protein per acre compared to 150 to 250 pounds per acre with continuous flooding and one harvest. A heavy application of nitrogen in the spring, coupled with intermittent irrigation, raised the crude protein yield to 2,000 pounds per acre.

California Association Offers New Booklet On Range Fertilization

A new 24 page booklet, "Range Fertilization," will soon be in print, and should be available in September through most local fertilizer suppliers in California and other western states, or upon application to the office of the California Fertilizer Association.

Published by the Association's Soil Improvement Committee, it is designed to tell the story of the significant benefits which follow proper fertilization of dry range land, when employed with other approved practices. Its purpose is to give livestock producers correct information on the use of fertilizers as a good management practice for range improvement.

Printed on good quality glossy coated paper, the dimensions will be 5⅜" x 8½", or coat pocket size, according to the Committee. Sixteen appropriate photographs will be incorporated, reproduced through the medium of copper half-tone plates. The text will be brief, and in large type for easy readability. Reports are made of increased meat production per acre; increased forage to the extent that extra hay can be put up; increased forage quality, especially in protein content; and longer grazing season; all through proper fertilization.

The fourteen chapter headings are: You Can Have Earlier Grazing; Increased Palatability Works For You; More Feed From The Same Acres; Reduce Your Labor Costs; Finish Lambs On The Range; Fight Both Drought And Cold Weather; Improve The Quality Of Your Forage; Save Your Soil And Your Rainfall; Make More Hay; Make Irrigation Pay; Fertilizer Can Carry Over; Three Plant Foods For Your Range; Answers To: How Much? When? Which?; and How To Apply Fertilizer To Rangeland.

The Committee reports that the booklet should be ready for distribution sometime during September, and copies may be obtained by addressing California Fertilizer Association at 475 Huntington Dr., San Marino, Calif.

Time Table Published by Kansas State

A Kansas fertilizer timetable just published by the agricultural experiment station at Kansas State College, Manhattan, will help farmers to determine kinds and amounts of fertilizers to use.

The table gives the fertilizer, time, method, and rate of application for 25 Kansas crops, ranging from the legumes, sorghums, and grasses, to vegetable crops. The chart also gives short sketches of particular needs of certain crops and, in some cases, expected results under normal conditions.

The timetable was taken from the 1956 revision of the experiment station's circular, "Fertilizer Recommendations for Kansas," by F. W. Smith, K-State agronomist.

Tom J. Clarke, controller of the Cooperative G.L.F. Soil Building Service, will be the luncheon speaker on Tuesday, October 22 at the National Safety Congress Fertilizer Section. He is a past chairman of the Section and is recognized throughout the industry as a safety authority. The title of his lecture will be, "The Man Who Wasn't There."

RESEARCH RESULTS & REPORTS

Growing weeds to death is a new technique made possible in theory by the advent of gibberellic acid. Seems that stunted weeds are immune to 2, 4-D so they will grow them to lush maturity, and then cut them down in their prime. All this by the very serious Davis group of U. of Cal., with Dr. Floyd Ashton as prime mover. Lab tests are now under way; field tests will follow.

O

Genetics will collaborate with plant food in the job being done at the Florida School of Forestry. They have found that some pine trees are growing 2½ times as fast as average trees, and some growing 3 to 4 times as fast. Taking these high speed trees for graft purposes, they hope to develop high speed orchards from which seed may be harvested, instead of going out into the woods for it. Drs. T. O. Perry and Wang Chi-Wu are in charge of the program. The big paper companies are cooperating.

O

Douglas fir seed cone production has been boosted sixfold by Weyerhaeuser Timber research people in the "cone orchard" they have set up on an 8 acre plot. Plant food produces 18 bushels of cones from treated trees, while check trees, untreated, produce only 3 bushels. Now if the boys in Oregon will just get together with the boys in Florida . . . we'll have no more talk about imminent shortages of pine for lumber.

O

Hard-shell seeds, such as pea and alfalfa can be made to sprout faster by radio wave bombardment. So they tell us at Washington State. The equipment has not been developed to the point of practical commercial use, but that's coming. The high frequency cracks the tough coatings of the seeds; promotes quick, simultaneous sproutings; helps plants mature at a uniform rate.

O

Cornell is running tests, measuring the weather and the growth of plants every fifteen minutes on four different crops. A fancy recording system is used, involving an IBM machine. Dr. Richard Bradfield, supervising, says: "Once we pinpoint exact conditions that limit our yields, we may be able to manage our soils and crops so that light and water, for example, can be used more efficiently."

O

Plant viruses can be detected in 45 minutes now, as compared to the 3 to 7-day tests formerly used. Pennsylvania State researchers have developed a new type of test, which works on juice extracts from the leaf tissue—pretty much, we judge, as an MD takes a smear. In fact this test involves 2% suspension of red blood cells. The test is so sensitive it showed up virus in plants that did not show infection for a month afterward.

Soil conditioning at 25¢ a pound is predicted from Davis, where M. T. Vittum has developed a new soil-crust preventive that may be available by next season. It has no commercial name, but is triphenyl sulfonium chloride.

O

At Woods Hole, Mass. the Marine Station found it tough to research phytoplankton because the zooplankton swam up and ate the crop. So they moved the whole deal indoors, where the crop can be fed plant food, the results noted, and it can be extracted in bulk. The purpose—to see if phytoplankton can be grown as a source of protein in powdered form.

Random NOTES & QUOTES

A question has been asked by the Committee for Economic Development, to find out what the best informed opinion of the free world regards as the most important economic problem to be faced by the US in the next 20 years.

Well, we are not claiming to be "the best informed opinion" but weighing this and that we feel that the problem to be faced most often in the future, as it has been in the past is "When do we eat?". Every parent knows this to be the fact. And, unless there's a lot more fertilizer bought and used in the future than there has been lately, every economist will know it, too.

Don't forget the population gain that's a rising wave right now, and means many more hungry mouths to feed somehow.

O

"Soil testing service" was the name of the little folder that hit our desk last month, and we wondered about it until we saw there the name of Bob Engle, long with National Fertilizer Association, and now fertiliser (spelled with an S, please) adviser to the US mission in India. Bob has written, in his usual clear-cut style, a lucid explanation of the need for soil testing, and how to take soil samples with a "khurpi", whatever that is.

O

Brazil has done such a job of education that now, we read, "Rio Grande do Sul needs a chemical fertilizer industry very badly." Estimates are that Brazil now needs 8,500,000 annual tons of fertilizer, and is 8,000,000 tons short. That does sound as though a feller could sell some mixed goods there.

O

Speaking of which, Chile has entered on an agricultural expansion program which they believe will cut in half the food imported from other countries. Food imports now are about a third of the total imports, and add up to some $120,000,000 annually.

The eight-year program includes opening up now idle land, the use of crop chemicals to kill the weeds that destroy 20% of the crop. The only problem is that by becoming self-sufficient in wheat and meat, Chile upsets the balance of their trade with Argentine which depends on swapping these commodities for Chilean coal, steel and lumber.

O

10 foot corn, and still growing. That's a story out of Ohio, where an aged gent named Stanley Bryan is do-

ing tricks with this plant food "formula": A pound of flour and five pounds of sheep manure dissolved in 50 gallon drums of water. The mixture ferments for about a week, and then goes on the garden. Research people, please note.

O

Chambers of Commerce are pretty useful places, but here's one goes a step further than usual . . . The city of Corpus Christi has developed two new sewage fertilizers, destined, they hope, to correct the alkaline problem of that area. And where do they test it? Why, on the lawn of the Chamber of Commerce, of course.

O

If you have been one of those worrying about the fact that the modern national headquarters of the National Grange in Washington were about to be demolished to make room for a huge new government building, relax. Congress cured that, for the time being at least, by failing to pass an appropriation for the new building.

O

Dow Chemical has announced a $2,000,000 program to curb smoke and get rid of what they delicately call the "distinctive odor" of their plants at Midland, Mich.

O

Texas ranches are mighty big, like everything else in that state. So it is not too surprising to read that 700 tons of powdered rock phosphate were recently shipped from Bartow, Fla. by International Minerals & Chemical. This is said to be the largest single order of plant food ever delivered to one individual at one time. It took five fan-type spreaders a week to apply the phosphate on 1400 acres.

O

Fly ash, it seems, is a big problem to coal-burning industry-power companies and such. In the good old days it went up the chimney, settled on the neighbors—and so the problem was dissipated. But when neighbor troubles forced the use of air-polution controls, the fly-ash stacked up.

They now make cement blocks out of some of it, and some is pelletized for easier storage, but the thing that brings this item into our realm is the fact that—to quote: "Dr. E. R. Spencer has discovered that the addition of fly-ash to certain soil in proper amounts substantially increases its productivity. The enriched soil also produces better vegetables and more brightly-colored flowers." All this is going on under the auspices of Union Electric, Lebanon, Ill., in case you want to look into it.

O

Soybean growers are so dependent on export markets—20% of beans and 40% of oil going abroad this year—that their associations are sponsoring market development projects in both Europe and Asia.

O

A recipe for making your own synthetic topsoil has received a patent.

Here is the recipe: Pulverize some igneous rock such as granite; pulverize some sedimentary rock, such as limestone; pulverize some gypsum and powder some clay.

Mix two parts of the granite with two parts of the limestone, one part of the gypsum and two parts of the clay. Then mix with approximately two and one half times its weight or organic material consisting of eight parts of peat, four parts of horse manure and seven parts of sewage sludge.

Place the mixture in a digester tank and ferment.

Concluded on page 63

"Even *wet* they're strong...

and burlap is easy to grasp," says Harlan Jackson, Montgomery, Ala. farmer. "I always order my fertilizer in burlap bags. I can sell the empties or use them around the farm. We can't afford costly delays and spillage because of torn containers—that's why we always use burlap bags. They're strong—they won't burst—and we can handle them as roughly as we want."

This farmer likes fertilizer in burlap bags that are easy to grasp and don't tear. How about your own handling and spillage problems? *What bag is strong even when wet?*

Just ask your own customers—

they'll tell you that burlap

Is strong — takes dragging, dropping, man-handling — any tough job on the farm.

Gives good ventilation — keeps farm supplies and products fresh.

Laughs at sudden showers — wetness or dampness can't weaken it.

Saves money — extra value from re-sale and re-use.

Saves storage space — stacks to any height without slipping.

Has 1000 uses — always in demand on the farm (popular with farm wives, too!)

THE BURLAP COUNCIL

of the Indian Jute Mills Association

155 East 44th Street, New York 17, N. Y.

Associations

New England Conference Plans Completed

Plans have been completed for the annual New England Fertilizer Conference, to be held under the auspices of the National Plant Food Institute, at the Bald Peak Colony Club, Melvin Village, N. H., on September 25, Dr. Russell Coleman, Executive Vice President of the Institute, announced today.

The sessions will feature an appraisal and analysis of factors influencing Northeast fertilizer-using practices, based on a survey conducted for the Institute by National Analysts, Inc., of Philadelphia.

Dr. Mason H. Campbell, Dean of the College of Agriculture and Director of Experiment Stations, at the University of Rhode Island, will preside and open the conference with an address of welcome. Vice President W. R. Allstetter will present greetings from the Institute.

Dr. M. S. Williams, Chief Agricultural Economist of the Institute, will present a report on "Factors Influencing the Use of Fertilizers in the Northeast." Following, an appraisal of factors influencing the use of fertilizers in New England will be presented by:

Harry R. Mitiguy, Agricultural Economist, Federal Reserve Bank of Boston; Henry M. Hansen, Associate Director of Extension, University of Connecticut; and Dr. Dale H. Seiling, Dean of the College of Agriculture, University of Massachusetts.

In the afternoon, three agricultural authorities will discuss the use of the National Analysts survey as applied to New England. The participants will be:

Dr. Roland H. Struchtemeyer, Head, Department of Agronomy, University of Maine; W. F. Henry, Head, Department of Agricultural Economics, University of New Hampshire; and Winston Way, Extension Agronomist, University of Vermont. Mr. Allstetter will discuss the Institute's plans for using the results of the survey.

Louis Webster, Director of the Division of Markets, Massachusetts Department of Agriculture, will be the banquet speaker and Edward R. Jones, member of the Institute's Board of Directors, will preside.

The conference, which will bring together representatives of the New England fertilizer industry and leaders of the New England colleges of agriculture, was arranged by Mr. Jones and Mr. Walter E. Meeken, also a member of the Institute's Board of Directors.

Registration will begin on the evening of September 24. Sessions will begin at 10:00 a.m., September 25, concluding with the banquet. The meeting will be open to members of the Institute and invited guests and reservations should be made with the Bald Peak Colony Club.

ACS Offers Subjects Of Fertilizer Interest

While the 132d national meeting of the American Chemical Society will schedule a broad variety of subjects, the fertilizer man will find it interesting to attend certain sessions in New York, September 8-13. Those who have or are having "neighbor trouble" will find valuable the session on air pollution, which will receive special consideration, and the division of agricultural and food chemistry will cover new crops for American agriculture, new uses for existing crops—and other allied subjects which should be part of the fertilizer salesman's ammunition.

NAC Meeting Sept. 4-6

Vergil D. Reed, vice president and associate director of Research, J. Walter Thompson Company, will be the featured speaker at the 24th Annual Meeting of the National Agricultural Chemicals Association, L. S. Hitchner, NAC executive secretary, has announced. The meeting will be held at Spring Lake, N. J., September 4, 5 and 6.

The relation of marketing to progress in the Agricultural Chemicals Industry is the theme of this year's Annual Meeting of the Association, Hitchner said. Other speakers during the three-day meeting will be Fred W. Hatch, manager, Agricultural Chemical Division, Shell Chemical Corporation; W. H. Prigmore, assistant general manager, Eastern States Farmers' Exchange, Inc.; Roswell Garst, partner, Garst and Thomas Hybrid Corn Company; and Drs. J. M. Bohlen and G. M. Beal, Department of Economics and Sociology, Iowa State College.

HELP YOURSELF TO BIGGER PROFITS

PHOSPHATE PRODUCTION
No other process begins to compare with *way-ahead* Sackett SUPER FLO in making normal, fortified and triple super-phosphates of premium quality at *way lower* cost.

MIXED GOODS MANUFACTURE
Your investment in the latest Sackett Methods of producing conventional fertilizers is *guaranteed* to pay handsome returns. We are anxious to prove it.

MODERNIZATION PROGRAMS
Step ahead of competition by entrusting your fertilizer expansion and modernization facility programs to our care. Many of the most forward-thinking fertilizer producers glad they did.

GRANULAR FERTILIZER
Sackett Equipment leads the field in Granular Production. The fertilizer companies who have selected Sackett Granulating Processes above all others, read like a "Who's Who in Industry".

NEW PLANTS
Invest your dollars wisely by having Sackett build your new plant. We do the whole job . . . from the inception stage thru building construction and equipment fabrication to operating plant. See for guaranteed results.

There is nothing that appeals to a man's reason more than plain facts. And, one plain fact is this . . . you can help yourself to bigger profits by resolving now to replace wasteful obsolete plant equipment with the latest rock-bottom cost methods as exemplified in Sackett Production Processes and Materials Handling Equipment. Why not start the ball rolling by writing or phoning us today?

THE A. J. SACKETT AND SONS COMPANY
SACKETT EQUIPMENT
BALTIMORE · MARYLAND

Architects and Manufacturing Engineers to the Fertilizer Industry Since 1897.

America's Foremost Creative designers & Builders of Commercial Fertilizer and Superphosphate Plants . . . Related Production Equipment

Industry Invited to Attend 11th Annual Meeting By Fertilizer Control Officials

Association of American Fertilizer Control Officials
Shoreham Hotel———Washington, D. C.
October 18, 1957

Note: States Relations Committee Meeting Thursday, October 17, 1957, at 8 p.m. Fertilizer Industry and Control Officials urged to attend.

MORNING SESSION

8:30-9:30—Registration, West Ball Room
Reading of Minutes
Report of Secretary-Treasurer ..... B. D. Cloaninger
Clemson, South Carolina
Announcements and Appointments of Committees
Roll Call by States
Presidential Address ..... J. D. Patterson
Salem, Oregon
Address ..... Paul T. Truitt
Executive Vice President
National Plant Food Institute
Washington, D. C.
Some Observations in Connection with the Advertising and Sale of Fertilizers ..... Commissioner Sigurd Anderson
Federal Trade Commission
Washington, D. C.
Plant Hormones and Growth Stimulants ..... Dr. Paul C. Marth
Senior Physiologist, USDA
Beltsville, Maryland
Commercial Aspects of Minor Elements in Fertilizer ..... Dr. R. P. Thomas
Technical Service Supervisor
International Min & Chem Corp., Plant Food Division
Chicago, Illinois

AFTERNOON SESSION, beginning 2:30

Liquid Commercial Fertilizers ..... Dr. J. Richard Adams
Senior Chemist, Fertilizer & Lime Section, USDA
Beltsville, Maryland
Report of Investigators:
General Terms ..... M. H. Snyder
Charleston, West Virginia
Nitrogen Products (Organic) ..... M. P. Etheredge
State College, Mississippi
Nitrogen Products (Inorganic) ..... J. W. Kuzmeski
Amherst, Massachusetts
Phosphorus ..... J. F. Fudge
College Station, Texas
Potassium ..... F. W. Quackenbush
Lafayette, Indiana
Calcium, Magnesium and Manganese ..... J. B. Smith
Kingston, Rhode Island
Boron ..... R. C. Berry
Richmond, Virginia
Zinc and Copper ..... H. J. Webb
Clemson, South Carolina
Sampling Bulk Fertilizer ..... M. B. Rowe
Richmond, Virginia
Registration Forms ..... George Laramie
Concord, New Hampshire
Publications & Tonnage Reports ..... Henry DeSalvo
Little Rock, Arkansas
Pesticides in Fertilizers ..... J. C. Jones
Richmond, Virginia
Specimen Labels ..... W. J. Huffman
Jackson, Mississippi
Specialty Fertilizers ..... E. A. Epps, Jr.
Baton Rouge, Louisiana

Fertilizer Solutions Meet Schedules Prominent Speakers

Charles P. Taft, mayor of Cincinnati, will open the 1957 convention of the National Fertilizer Solutions Association at the Netherland Hilton Hotel in Cincinnati on November 18.

Two outstanding features of the convention program will be panel discussions on the "Material Supply Outlook" and on the subject "Essentials to Success."

Suppliers to the industry discussing the "Material Supply Outlook" will include Bert Tucker of Sohio Chemical Company on "Nitrogen," W. R. Bone of Monsanto Chemical Company on "Phosphoric Acid" and Dean Gidney, of United States Potash Company on "Potash."

Ohio State University will furnish members of the panel on "Essentials to Success"—including Dr. John K. Pfahl, assistant professor of Finance, on "Sales Ethics"; Dr. Gordon Ryder, Extension agronomist, on "Agronomy," and Dr. John Sharp, Agricultural Economics department, on "Economics."

Dr. Edwin F. Adler, plant physiologist, of Lilly Research Laboratories, will be a member of a 3-man panel on "Additives to Fertilizer Solutions," speaking on "Possibilities of the New Hormones." Other subjects to be discussed by this panel are "Trace Elements" and "Various Pesticides in Fertilizers."

Mack Sauer, publisher of "The Leesburg Citizen," Leesburg, Ohio, will be feature speaker for the annual dinner November 19. Mr. Sauer, prominent as a humorous and entertaining speaker, will use the topic, "A Country Editor Spreads It On."

General Convention Chairman Ernest M. Harper, Nitrogen Division of Allied Chemical & Dye Corporation, states that details of the program now are nearly complete.

Sturtevant Offers 1957 Dry Processing Catalog

Sturtevant Mill Company, Boston 22, Massachusetts, has published a 1957 eight-page Dry Processing Equipment catalog, in which air separators and their use in closed-circuit grinding, micronizer fluid energy mills grinding, and rotary batch blenders are described in detail.

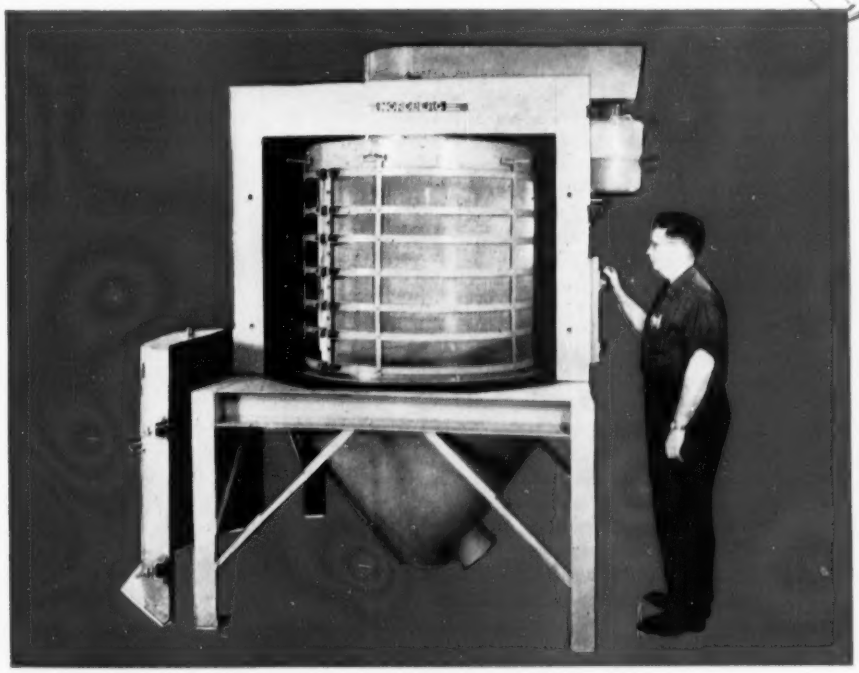
Bauer Processing Equipment Depicted in Catalog

Bauer processing equipment for various industries is illustrated and described in the new, 4-page bulletin No. 57, recently released by The Bauer Bros. Co., Sheridan Avenue, Springfield, Ohio.

Equipment shown for use in pulverizing, fiberizing, granulating and blending various materials includes Bauer hammer mills, double and single disc attrition mills, single and double roll crushers and magnetic separators.

Too many fines in your product?

. . . UPGRADE WITH THE SYMONS V-SCREEN®



A new type screen that utilizes centrifugal force which is especially designed for sizing material in the finer sizes, ranging from 4 mesh down to as small as 80 mesh in some cases.

Laboratory tests show it—more uniform product quality proves it—the Symons V-Screen gives you very high efficiency and large capacity removal of fines. Investigate its application in your plant . . . whether for raw material screening or for assuring a consistently sized finished product.

NORDBERG MFG. CO., Milwaukee, Wisconsin

SYMONS . . . a registered Nordberg trademark known throughout the world.

SEND FOR FREE BULLETIN

Clip and mail the coupon for your copy of Bulletin 243, which gives the complete story on Symons V-Screens.

NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • ST. LOUIS • DULUTH • WASHINGTON
TORONTO • MEXICO, D. F. • LONDON • GENEVA • JOHANNESBURG

Nordberg Mfg. Co., Milwaukee, Wisconsin CF
Send V-Screen Bulletin 243 to:

Name_____

Company_____

Address_____

City_____ Zone____ State_____

S257

Another 'First' for Iowa Plant Food Co.

New Screening Set-up Boosts On-Size Output Of Granular Goods

The Iowa Plant Food Company, formed at Des Moines in 1946 by Iowa Farm Bureau Federation, pioneered a new era in the manufacture of chemical fertilizers in the United States. It was the first commercial plant of its type to manufacture high analysis mixed fertilizer in granular form.

The granular product produced by Iowa Farm Supply through a now-conventional "non-slurry" process consists of combining a mixture of relatively dry solids (various grades of potash, ammonium sulfate and phosphatic materials) for agglomeration through addition of a liquids (acids, water, nitrogen solutions and anhydrous ammonia) during suitable agitation. Mixing is done in a TVA-type ammoniator and this mixture is then formed into spherical granules by rolling in a horizontal revolving drum.

The granules are reduced by the dryer to a free moisture content of one per cent or less, to assure good product condition for storage and application.

The dried granules range in size from approximately 0.375" (3/8") diameter to small grains. These granules are then sized over a vibrating screen equipped with a 0.156" (5 mesh) square mesh cloth. Oversized granules from this scalping operation are crushed and resized over the scalping screen. The undersize from the conventional vibrating screen, minus 0.156 (5 mesh) to dust, is fed to to Symons V-Screen (the "V" is for vertical) for final sizing on about 20 mesh, thus giving a final product of 0.156 to .032 (minus 20 mesh) in size. The minus 20 mesh discharge of the V-Screen is returned to the ammoniator for reprocessing.

The V-Screen was especially designed by Nordberg Manufacturing Co. of Milwaukee for sizing material in the finer size ranging from 4 mesh down to as small as 80 mesh in some cases. The V-screen is the only vibrating screen that does not depend on gravity alone to size. It utilizes the additional force of centrifugal action created by its rotating vertical drum. This centrifugal force helps get near-size particles through the apertures quickly and results in a more efficient screening job at higher capacity than is possible through the use of a vibrating screen that depends on gravity alone to size.

The drum on the vertical screen at Iowa Farm Supply is equipped with stainless steel wire mesh cloth of .032" square openings and has a wire diameter of 0.014". During pre-installation tests, the V-Screen accepted as much as 80 tons per hour of feed for sizing on 20 mesh but in present normal operation, the material is fed to the screen at the rate of up to 55 tons per hour, varying with formulation and grade.

Material from the dryer is fed continuously to the screening section and thus the screen is in continuous operation. Because the material being screened is in excess of 200° F., the vertical screen is equipped with an automatic-circulation oil lubrication system instead of the standard grease lubrication normally used on the V-Screen.

The amount of oversize and undersize in the feed varies but on an average consists of 30% through the 20 mesh cloth. This amounts up to .46 tons per hour per square foot through the .032" square opening, which is considered a high capacity for a sizing operation through an aperture of this size.

An average sieve analysis of the product of the V-Screen, frequently made by IFS laboratory personnel to assure a consistently-sized product at all times, is as follows:

Retained on Mesh	Per Cent by Weight	Cumulative % by Weight
5	0.3	0.3
16	89.7	90.0
20	6.0	96.0
—20	4.0	100.0

This indicates an efficiency of the screening operation of 96 per cent.

The design of this type of granulating plant was worked out by Iowa Farm Bureau personnel with the assistance of equipment manufacturers representatives. John R. Porter, director of the Plant Food Division at Iowa Farm Supply, indicated that in maintaining a satisfactory granulation process, many of the originally-installed items of equipment have been replaced and modifications in the techniques were made frequently. This "pioneer" plant has served well as a "guinea pig" through a fast-changing decade in fertilizer technology.

1. Plant Manager Sidney Bondurant points out the flow of materials in the rolling and compacting drum to one of many visitors at the country's first high analysis granular fertilizer plant.
2. Symons V Screen combines centrifugal force with gravity to remove fines from the various grades of granular fertilizer.
3. A continual check is made of each grade of finished product in the well-equipped Quality Control Lab by Chemist Rex Walker. The three-man laboratory staff is headed by Al Malone.

CALIFORNIA

California Ammonia Company, reported here last month, has supplied more detail concerning the organization that was available as we went to press for August. Following is the most recent data on the subject:

"The organization has been completed of the **California Ammonia Company** as a jointly owned enterprise of 400 farmers and the **Best Fertilizer Company.**

"Stockholders meeting in Stockton elected directors who subsequently organized and announced plans for a $4,000,000 plant at Lathrop, San Joaquin County, to produce 25,000 tons of anhydrous ammonia yearly.

"**Bernell Harlan,** a farmer of Woodland, Yolo County, heads the new company as president; while **Lowell W. Berry,** president of the participating fertilizer company, is chairman of the board.

"Other farmer members of the board are **Adolph Merwin,** Clarksburg, Yolo County; **K. R. Nutting** of Salinas; **Lloyd Harnish** of Fresno; **David Petz** of Tracy, San Joaquin County; **C. Martin Wilmarth** of Grimes, Colusa County, and **Lawrence Baldwin** of Bakersfield.

"Construction of the new plant is scheduled to start soon with completion expected in 12 to 15 months.

"The plant will provide low cost nitrogen for use by grower owners in farming and for ammonia for use by the fertilizer company in the manufacture of ammonium sulphate, ammonium phosphates and liquid fertilizers.

"Board members noted the partnership between the company and the farmers will help solve a storage problem, in that grower demand will be heaviest at certain seasons, with the fertilizer company in a position to use the product on a year around basis. This will eliminate the problem of large scale storage.

Mr. Harlan said adequate money from grower members and the fertilizer company is in escrow to make immediate construction possible.

" 'The job has not been easy,' he said of the seven months planning. 'There are many demands on farmers' money at this time of year for other purposes. However, we grower members are satisfied it is worth the effort.' "

ILLINOIS

Peine Grain Co., Minier have completed a new liquid fertilizer plant and were planning an Open House as we went to press. Robert Peine is quoted as saying he is looking forward to the day when surplus crops will cease to crowd warehouses, and the fertilizer plant will be important in the growth of needed added crops. The new set-up includes three 10,000 gallon, a 5,000 gallon, and three 3,000 gallon tanks. Tailor-made mixtures will be offered.

INDIANA

Stauffer will process oil refinery sludge acid from the Whiting-Hammond area refineries when it completes its 400 daily ton, $4,000,000 sulphuric acid regeneration plant at Hammond.

KENTUCKY

Spencer Chemical Company has announced plans to construct a new urea plant at the company's Henderson Works. **Kenneth A. Spencer,** president, stated that the new facility will produce approximately 100 tons a day of urea and should be completed in the summer of 1958. The company already produces urea at its Vicksburg, Mississippi, Works.

Mr. Spencer said that the addition of this urea capacity will provide the company increased flexibility in its program of upgrading ammonia to a broad variety of marketable products. The new facilities will convert a portion of the ammonia currently produced at the Henderson Works to the urea-type solutions already produced at Vicksburg and also to prilled solid urea, an addition to the company's product line. Spencer stated that the urea expansion is in response to increased demands for urea for certain applications.

The new Spencer plant will utilize the Fauser-Montecatini process for urea manufacture, according to **Montecatini.** This will be the third American plant to utilize the Fauser-Montecatini process to produce urea. Spencer is already successfully operating a urea plant at Vicksburg, Miss., and **Shell Chemical Co.** is producing urea by the Fauser-Montecatini process at its plant in Ventura, Calif., Montecatini reports.

LOUISIANA

Freeport Sulphur has been given the green light by the Secretary of the Interior to start mining the vast sulphur deposits in the Gulf of Mexico, which consists of 35,000 acres of submerged land off the Louisiana coast, discovered, as readers of this department know, by **Humble Oil.** Freeport has previously announced plans to use the Frasch hot water process. They are required, by the clearance to go into production by November 1 of next year.

MISSISSIPPI

Coastal Chemical Corporation which started construction on the first units of its $7 million Bayou Casotte operation in April, expects to start actual production in its fertilizer plant by November.

Owen Cooper, executive vice-president states that the construction schedule should be completed for early November operation "if the high analysis fertilizer units are completed by that time."

Initial operation will call for employment of about 125 people with the employment level to be upped as other units are constructed and put into operation.

Mr. Cooper asked the Jackson County board of supervisors that $750,000 in BAWI (Balance Agriculture with Industry) bonds, already approved, be sold September 6. The funds will be used for construction of warehouse storage facilities and other plant purposes at the $7 million dollar installation.

The company hopes to award a contract for construction of an anhydrous ammonia plant at Bayou Casotte in November. Financing for this unit is well under way.

MISSOURI

Atlas Powder Company have announced, via President **Ralph K. Gottshall** that they will replace their present nitric and ammonium nitrate facilities at Atlas with the "self-sustaining" type—first of its kind in this country, they report. The cost is figured at $4,000,000.

SOUTH CAROLINA

Etiwan Fertilizer, Charleston, has applied for permission to construct a wharf in Shipyard River, some 15 feet east of their present facilities there. The wharf is to be 300 feet long and 52 feet wide.

TEXAS

Stauffer's Consolidated Chemical Industries division has completed plans to more than double capacity of its Baytown sulphur recovery plant, construction to begin at once, and to be in operation early next year. The plant draws sulphur-content gases from adjacent **Humble Oil** refinery.

UTAH

U. S. Steel's plant at Provo, it now develops, is in the nature of a test for future expansion into the whole field of fertilizer chemicals—anhydrous, ammonium nitrate, nitric acid. New plants, if built are likely to be in the East and the Midwest.

WYOMING

Davison Chemical's exploratory survey, reported here last month, has developed into the definite announcement that they will build at Casper a $2,000,000 sulphuric acid plant—scheduled to go into service in July of next year. It is to have a capacity of 200 net daily tons.

AUSTRALIA

Shell Refining will build at Geelong the first Australian plant to produce sulphuric from oil refinery gases. Due to be in operation late next year, it is to produce 100 daily tons and cost $1,200,000.

BURMA

Fertilizers & Chemicals Ltd., Israeli concern, is bidding for construction of a superphosphate plant in Burma, and a second plant for triple superphosphate.

CANADA

Canadian Industries Ltd. are converting their Ontario plants to continuous granulation. The plants are operated by **William Stone Sons**

Ltd., which was acquired by CIL last year. The plants are at Hamilton, Chatham and Ingersoll. All are expected to be converted by early next year.

FRANCE

Societe des Produits Chimiques d'Aquitaine is planning plants to produce, among other things, ammonia from the abundant natural gas resources in the southwest of France.

PAKISTAN

By an agreement between America and Pakistan, two fertilizer plants are under consideration, in both "wings" of the country. They are to cost Rupees 200,000,000 and have an ammonium phosphate capacity of 200,000 tons. Negotiations for American machinery are now in progress. Construction is likely to go to "an Italian firm"—presumably **Montecatini.**

SOUTH AFRICA

African Explosives and Chemical Industries, Ltd. (a subsidiary of **Imperial Chemical Industries, Ltd.**) has recently awarded a contract to **Chemical and Industrial International, Ltd.,** of Nassau, Bahamas, for construction of a 150 daily-ton nitric acid plant which is to be integrated with their existing facilities near Johannesburg.

Chemical and Industrial International, Ltd., has licensing rights to all the processes of **The Chemical and Industrial Corp.,** of Cincinnati, Ohio, who will do the design and engineering work on this plant. This unit is C&I's standard high pressure (approximately 100 psi) nitric acid plant. It will be equipped with an electric motor driven centrifugal compressor and expander turbine. The plant is expected to go on stream during the spring of 1958.

Delaware Mixer Continues Modernizing

New Bagger, Conveyor Double Capacity at Price's Plant

Installation of a new bagger and a series of conveyors have doubled production and made possible more efficient use of labor at the Warner W. Price Company, Smyrna, Delaware. The installation features a Bemis Rapid-Weigh Bagger and Oliver conveyors. The bagging machine, an open-mouth packer, replaced a valve packer used previously.

The Price Company manufactures a line of high grade fertilizers. Part of the plant's output is packed in 125-lb. burlap bags. The new unit fills these at the rate of 16 bags per minute, whereas the previous machine filled only 8 bags per minute.

The remaining portion of the output is packaged in 80-lb. multiwall bags, and these are also packed by the Rapid-Weigh machine at the rate of 16 bags per minute. President Warner W. Price, Jr., points out that the equipment is capable of filling up to 24 bags per minute, but the present sewing machine conveyor set-up is not adequate to handle the additional production. As the company's program for efficient modernization continues, however, this rate will increase still further.

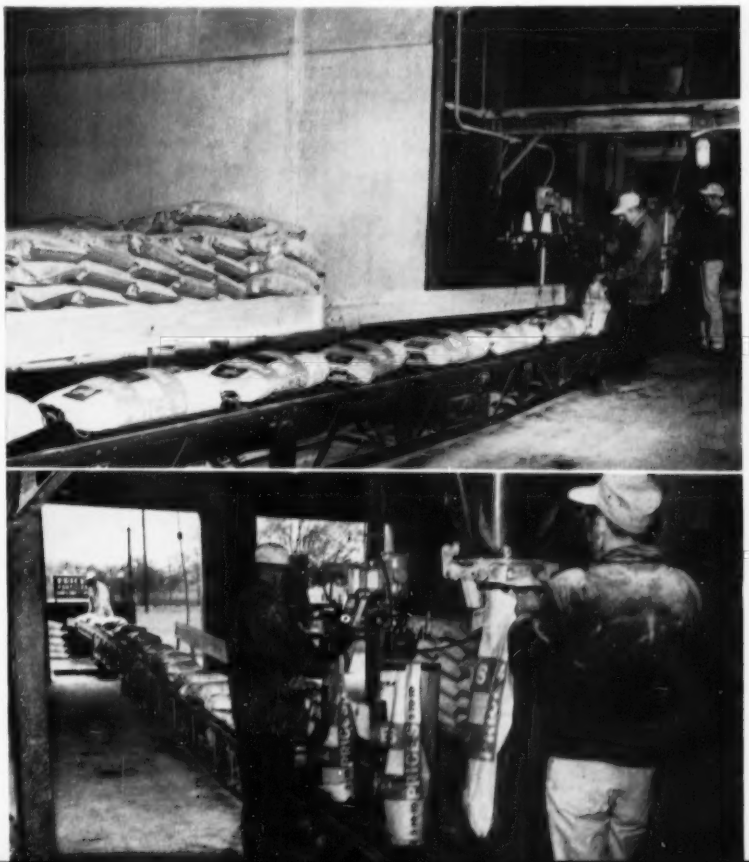
The conveyors were installed for use with the new bagger. They are used in series and carry filled bags from the sewing machine to the loading dock, and then by an expandable conveyor right onto waiting trucks. Thus the only manual lifting of filled bags occurs when the man on the truck removes the bags from the conveyor and stacks them in place.

Formerly the filled bags at the plant were loaded on waiting trucks manually. Bags were lifted onto a two-wheel hand truck, pushed to the customer's truck, lifted off the hand truck and stacked in place. The hand truck was then wheeled back to the packer for another load. The use of conveyors not only has speeded up the operation, but has released two men formerly employed on the loading dock for more productive work inside the plant.

Summing up the operation of the new packer-conveyor line, Mr. Price says: "With the Bemis Rapid-Weigh Bagger we get a greater amount of production per minute at a much greater degree of accuracy for weights, and the use of the conveyors eliminates two men from the previous operation."

The Rapid-Weigh Bagger is manufactured by Bemis Bro. Bag Company, Minneapolis, Minnesota. The conveyors are manufactured by the A. B. Farquhar Division, Oliver Corporation, York, Pennsylvania.

Above: Bags of Price's plant food flow from recently-installed open mouth bagger which fills both burlap and multiwall bags with average weight tolerances of two ounces or less. **Below:** Fill-sew-load—That's the packing operation at the Warner W. Price Company, Smyrna, Delaware. Bags are filled by the new Bemis Rapid-Weigh Bagger, sewed, and delivered by conveyors to the customer's truck.



Southwest Conference "Most Successful"

Fertilizer industry representatives, State Control officials and their families attending the Southwestern Fertilizer Conference and Grade Hearing at the Buccaneer Hotel, Galveston, Texas July 17 through 19 acclaimed it to be the most successful meeting in the history of the association. While most of the fertilizer manufacturers and control officials were from the area comprising Texas, Oklahoma, Mississippi, Arkansas, Louisiana and New Mexico, many basic producers were present from New York, Washington, Atlanta, Chicago and the West Coast. The attendance exceeded 300.

The meeting consisted of two business sessions, two social receptions and a banquet and dance. The golf tournament was headed by Tom Wright of Texas Farm Products Company, Nacogdoches, Texas. Highlighting the convention was the reception, banquet and dance held the evening of July 18 in the newly completed Moody Foundation Center which was constructed at a cost of several million dollars. The Moody Center is equipped with electronic kitchens and the latest ultra equipment and is capable of serving 3000 people at one sitting. It can cook a ton of turkeys every fifteen minutes.

Stanley Hackett, Dixie Fertilizer Company, Shreveport, was chairman of the morning session July 18. Bill Dunklin of Planters Fertilizer and Soybean presented the response.

Dr. Russell Coleman, executive vice-president of the National Plant Food Institute, was the featured speaker July 18. Since many of those attending the Galveston meeting were not at the Greenbrier, Dr. Coleman again explained the purpose of the new expansion program of the NPFI with the aid of charts and slides projected on a screen. The three main projects of the expansion program are:

1. To broaden and strengthen fertilizer research through increased grants to universities and colleges.
2. To initiate a farm demonstration program in cooperation with state and federal agencies.
3. To develop more specific informational programs based on the results from research and demonstrational projects.

"The plan will be principally concerned with developing the present market potential" he said. "Farm demonstrations conducted in local areas will give the Institute information on which it can project a broad localized informational program. It is the purpose of this program to enlist the cooperation of local newspapers, radio and television stations, agricultural publications, bankers, dealers, professional agricultural workers and others to tell the fertilizer story based on agronomic and economic information."

Dr. Coleman mentioned that the first step in the expansion program will be the employment of four regional managers and the establishment of regional Institute offices. Actual locations have not been decided but the possibility of Shreveport, Louisiana, as a district probably reporting to Atlanta, a prospective regional office, was mentioned. He also said "The fertilizer industry has a capacity to produce substantially more plant food than it is now selling. Yet agricultural leaders say that fertilizer usage should be at least twice the present consumption."

Dr. J. F. Fudge, state chemist, Texas A. & M. presided over the Southwestern Annual Fertilizer Grade Hearing Friday, July 19.

Henry DeSalvo, head of the feed, fertilizer and pesticide division, Arkansas State Plant Board reviewed the recent Arkansas laws that have been adopted and their provisions are:

1. Require reporting of shipments by invoice.
2. Sets registration fees on brands.
3. Sets penalties for deficiencies in nitrogen, available phosphoric acid, and potash.
4. Sets penalties for weight shortages.
5. Empowers the plant board to set penalties on other guaranteed constituents not mentioned in regulations.
6. Empowers the plant board to issue stop sale on any shipment found deficient and require same to be relabeled by manufacturer or returned to plant for reformation.

Dr. R. L. Beacher, director of the Arkansas Soil Testing Laboratory, mentioned the fertilizer ratios that were recently approved in Arkansas are: 0-1-1, 0-1-2, 0-2-1, 1-1-0, 1-1-1, 1-1-2, 1-2-1 1-2-2, 1-4-4 and 3-4-6. Minimum grades recommended are 0-14-14, 0-10-20, 0-16-8, 10-10-0, 8-8-8, 6-6-12, 5-10-5, 5-10-10, 3-12-12 and 6-8-12. Other ratios permitted in Arkansas are 0-2-3, 1-3-6, 1-3-9, 2-3-9 with the minimum grades for these being 0-10-15, 3-9-18, 3-9-27, and 6-9-27.

Dr. M. B. Sturgis, head of the Agronomy Department, Louisiana State University, summarized the general fertilizer recommendations of the agronomists from Louisiana.

FOR COTTON: On alluvial soils, use 60 to 100 pounds of nitrogen per acre applied before or at planting or as a side dressing from either solid or liquid carriers. Where good yields of legume cover crops have been turned under the nitrogen applications may be reduced. Where available soil phosphorus is low 50 or more pounds of P_2O_5 should be applied in addition to nitrogen. These elements may be supplied by the application of 400 or more pounds per acre of the 15-15-0 or 10-10-0 grades. On alluvial soils where potassium deficiency is prevalent use 50 to 70 pounds of N per acre, 50 pounds of P_2O_5 and 50 to 70 pounds

Dr. Sturgis, L.S.U., Baton Rouge, La.; Joe Keough, University of Arkansas; David Byrnside, L.S.U.; Gregg Marshall, L.S.U.; B. E. Newman, L.S.U.; Millard Perkins, Louisiana; Dr. J. F. Fudge, Texas State Chemist; Dr. R. L. Beacher; H. T. Blackhurst, Texas; E. A. Epps, L.S.U.; Woody Miley, Arkansas; Duke Thornton, Texas; Henry DeSalvo, Arkansas; L. G. Jones, L.S.U.; D. R. Paterson, Texas; Parks Yeats, Oklahoma.

of K_2O. These plant nutrients may be applied in the 8-8-8 or 4-8-12 grades. If the 4-8-12 grade is used, extra nitrogen should be applied as side dressing.

Continued on next page

1. New Moody Exhibition Building, Galveston, Texas, where part of the convention was held.

2. Stanley Hackett, Dixie Fertilizer Co., Shreveport, La., Chairman of the meeting.

3. Russell Coleman, Vice-President, N.P.F.I., addressing convention.

4. Sherman Clarke, Freeport Sulphur Co., Houston; Lloyd Dhonau, Arkansas Plant Food Co., North Little Rock; E. O. Baber, Chilean Nitrate Sales Corp., Little Rock; Gus Ashcraft, Duval Sulphur & Potash Co., Houston; Bill Burns, International Minerals & Chemical Corp., Texarkana, Tex.; Pete Stultz, Red Star Fertilizer Co., Sulphur Springs, Tex.

5. Harold Hamby, Chilean Nitrate, Shreveport, La.; Jim Dawson and Mrs. Dawson, Fidelity Chemical Co., Houston; R. M. Cole, Swift & Co., Houston, Joe Marsallis, Chilean Nitrate, Shreveport, and S. B. Tatem, Swift & Co., Houston.

6. Joe Wright, Texas Farm Products Co., Nacogdoches, Texas; Texas Rangers E. D. Gooding, Houston, Mark James, Huntsville, and Harold Trammell, Farmers Fertilizer Co., Texarkana, Tex.

7. Dan Ellis, Ozark-Mahoning, Tulsa, Okla.; Bill Young & Mrs. Young, American Potash & Chem. Corp., Shreveport, La., Dick Kenyon, Phillips Petroleum Co., Tulsa, Okla.

8. Scottie Pegues, Olin Mathieson, Houston; Walter Peevy, L.S.U., Baton Rouge, La., Fielding Reed, American Potash Insttute, Atlanta; Sinclair McCoy and Len Gopp, both wth International Minerals & Chemical Corp., Chicago; Frank Reedy, Green & Reedy, Franklinton, La.

9. Bill Dunklin, Planters Fertilizer & Soybean Co., Pine Bluff, Ark.; Stuart Rozas, James Bachemin and A. L. Gayloe of Kelly, Weber & Co., Lake Charles, La.

10. Albert Kinnard, Nitrogen Div., Allied Chemcal & Dye Corp., Arnold Newman, Longhorn Construction Co., Sulphur Springs, and Massey McConnell, Commercial Solvents Corp.

11. Al Woods, Southwest Potash Corp., Little Rock; Massey McConnell, Commercial Solvents Corp., Sterlington; Walter Peevy, L.S.U., Baton Rouge; Dean Smith, Hi-Yield Fertilizer Co., Bonham, Tex., and Jud Drewry, International Minerals & Chemical Corp., Shreveport.

12. Doug Kelly, Monsanto Chemical Co., El Dorado, Ark.; Tom Wright, Texas Farm Products, Nacogdoches, Tex.; Russell Coleman, N.P.F.I., Washington, D. C., and Sam Clements, Monsanto Chemical Co., St. Louis, Mo.

13. George Dunklin, Planters Fertilizer & Soybean Co., Pine Bluff, Ark.; Harold Trammell, Farmers Fertilizer Co., Texarkana, Tex.; Floyd Prather, Central Texas Fertilizer Co., Comanche, Tex.; W. J. Pritchett, Chase Bag Co., Houston; C. J. Bown and Bob Hays, both with Grace Chemical Co., Memphis.

14. Mrs. J. F. Fudge, College Station, Tex.; Mrs. Meggs and J. E. Meggs, Nichols Fertilizer & Chemical Co., Oklahoma City; Mrs. Miller and Don Miller, Armour Fertilizer Works, Houston.

15. Fred Broadway, National Potash Co., Montgomery, Ala.; Joe Wepfer, El Dorado Fertilizer Co., El Dorado, Ark.; E. L. Freeman, Southern Cotton Oil Co., Little Rock; Bill Breshear, National Potash Co., Shreveport, and Paul Lennier, Pittsburgh Fertilizer Co., Pittsburg, Tex.

16. Scottie Pegues, Cedric Gran, Mit Morehead and George Kelt, all with Olin Mathieson Chemical Corp.

17. H. G. Wells, Armour Fertilizer Works, Dallas; A. B. Beasley, Harold Bingham, B. L. Mitchelson, J. C. Denton, all with Spencer Chemical Company; Rex Morgan, Ark-Mo Plant Food Co., Corning, Ark., and Russell Coleman, NPFI, Washington, D. C.

On soils of the Coastal Plain, Coastal Prairies and Pleistocene Terraces and Loessial Hills apply 50 to 60 pounds per acre of N, 50 to 60 pounds of P_2O_5 and 50 to 60 pounds of K_2O. These nutrients may be supplied by the application of 8-8-8 or higher grades. On upland soils where rust or potassium deficiency is more prevalent more potash is needed and 60 or more pounds per acre K_2O should be used and may be applied in the 4-8-12, 5-10-10 or 3-12-12 grades. In all cases where the initial application of fertilizer at or before planting carries less than 50 pounds per acre of nitrogen, extra nitrogen should be added as a side dressing.

FOR CORN: On heavier and more fertile alluvial soils, use 80 to 120 pounds of nitrogen per acre. The nitrogen may be applied before or at planting or as a side dressing. If applied as dressing, it should be applied before the corn is knee high. Stands should contain 10,000 to 14,000 plants per acre.

On soils of Coastal Plain, Coastal Prairies, Pleistocene Terraces and Loessial Hills and lighter alluvial soils use from 70 to 100 pounds per acre of N, 25 to 50 pounds of P_2O_5 and 25 to 50 pounds of K_2O. These amounts of plant food may be supplied by the application of 300 to 600 pounds per acre of 8-8-8, 5-10-10 or 5-10-5 or their equivalents in higher grades before or at planting and by sidedressing before the corn is knee high with 50 to 80 pounds of nitrogen. Stands should contain at least 9,000 plants per acre. Where the moisture conditions are very favorable more nitrogen should be applied and the stands should be thicker.

FOR OATS: On alluvial soils for grain only, use 45 to 60 pounds of nitrogen as a top dressing. On soils of Coastal Plain, Coastal Prairies, Pleistocene Mississippi Terraces and lighter alluvial soils, use 300 to 500 pounds per acre of 8-8-8, 5-10-10 or 5-10-5 or multiples of these in higher grades at planting and top dress with 30 to 60 pounds of nitrogen. Oats on these soils require 60 to 80 pounds of N, 30 to 40 pounds of P_2O_5 and 20 or more pounds of K_2O per acre.

If oats are to be used for dairy pasture, apply fall, winter and spring top dressings of nitrogen at the rate of 30 to 45 pounds per acre for each top dressing in addition to the use of 400 or more pounds per acre of one of the above grades or the equivalent in a higher grade at planting.

FOR SUGAR CANE: Fertilizer recommendations for sugar cane were prepared jointly by the Louisiana Agricultural Experiment Station and the U.S. Department of Agriculture Sugar Station, Houma, La.

To plant cane on light and me-

1. Fred Broadway, Montgomery, Ala., and Bill Brashear, Shreveport, La., both with National Potash Co.; Jimmy Powledge, National Hotel Co., Galveston, Tex.; and Bob Linderman, International Minerals & Chemical Corp., Chicago.

2. John Shamp, U. S. Phos. Products Co., Indianapolis, Ind.; Bill Young, American Potash & Chemical Corp., Shreveport, La.; A. G. White, Tennessee Corp., Waco, Tex.; and Ogden Swann, Tennessee Corp., Atlanta, Ga.

3. Mrs. Joe Wright, Mrs. Tom Wright, and Joe Wright, Texas Farm Products Co., Nacogdoches, Tex.

4. Mrs. Rex Morgan, Corning, Ark.; S. B. McCoy, International Minerals & Chem. Corp., Chicago; Mary Lou Field, Mrs. Field, M. G. Field, Meridian Fertilizer Co., Hattiesburg, Miss.; J. H. Drewry, International Minerals & Chemical Corp., Shreveport, La.; Mrs. S. B. McCoy, Chicago; Jim Cookesley, International Minerals & Chemical Corp., Chicago.

5. Zaney Blaney, the Magician; Norman J. LeBlanc, Mrs. Billings and Calvin Billings, all with Mid-South Chemical Corp., New Iberia, La.

6. Mr. & Mrs. Gerald Wakefield, Olin Mathieson Chemical Corp., Little Rock; Z. H. Calhoun, Southern Cotton Oil Co., Little Rock.

7. A. L. Bennett, Amarillo, Tex., and E. K. Chandler, Lafayette, La., both with Phillips Petroleum Corp.; John Zigler, International Minerals & Chemical Corp., Chicago; Fremont Lange, Ark-Mo Plant Food Co., Walnut Ridge, Ark.; and Sam R. Clement, Monsanto Chemical Co., St. Louis.

8. Mrs. B. L. Henderson, Houston, Tex.; Bob Hays, Grace Chemical Co., Memphis, Tenn.; Mrs. Horn, Walter Horn, Farmers Chemical Co., Joplin, Mo.; Mr. & Mrs. C. J. Brown, Grace Chemical Co., Memphis, and Mrs. Bob Hays.

9. Mr. & Mrs. Bill Tyler, Longhorn Construction Co., Sulphur Springs, Tex.

10. Jim Cooksley, International Minerals & Chemical Corp., Chicago; James Campbell, Virginia-Carolina Chemical Corp., Shreveport, La.; R. A. Jenkins, Virginia-Carolina Chemical Corp., Memphis, Tenn.; Art Long, International Minerals & Chemical Corp., Chicago.

11. Bill Lible, International Minerals & Chemical Corp., Chicago; Tom Longnecker, Texas Research Foundation, Plainview, Tex.

dium textured soils apply 40 to 60 pounds of nitrogen per acre by use of any of the common carriers. On heavy textured soils apply 60 to 80 pounds of nitrogen. When the green weight of legumes turned under ahead of planting cane is as much as 8 to 10 tons per acre, it is not necessary to fertilize plant cane. In most cases the yields of legumes are not this high. Where poor legume growth has been observed, responses to P_2O_5 and K_2O can be expected.

On stubble cane on the medium textured to heavy alluvial soils of the Mississippi or Red River bottoms, use 80 to 100 pounds of nitrogen per acre. Where known deficiencies of phosphorus and potassium exist, which is usually in the very fine sandy loam and silt loam types, 25 to 40 pounds of P_2O_5 and 40 to 60 pounds of K_2O should be applied in addition to nitrogen. In some cases the plant food may be supplied by the application of 500 pounds of 4-8-12, 5-10-15, or 0-14-14 per acre supplemented with 60 to 100 pounds of nitrogen from either solid or liquid materials.

To stubble cane on the medium to light textured soils of the Pleistocene Mississippi terraces, which areas are largely west of the Teche and include the Richland, Olivier and Iberia soils series, apply 80 to 100 pounds of N, 25 to 40 pounds of P_2O_5 and 40 to 60 pounds of K_2O.

Nitrogen may be supplied from any commonly available solid or liquid material. Where anhydrous ammonia is being used to supply nitrogren, minerals may be applied either before the ammonia or in the same operation from hoppers mounted on the sides of the tractor. The practice of splitting applications of nitrogen to stubble cane on medium textured soils where as much as 80 or more pounds of nitrogen is applied is proving profitable in some cases. Half of the nitrogen can be applied four inches deep in the middles at the last cultivation. Ammonia and other highly soluble carriers of nitrogen are especially adaptable to split applications.

FOR PASTURES: To fall or winter planted mixed clover-grass pastures on Coastal Plain, Pleistocene Terrace and Coastal Prairie soils at time of seeding, apply 20 to 40 pounds of N, 60 to 100 pounds of P_2O_5 and 60 to 100 pounds per acre of K_2O. The nutrients may be applied by the use of 500 to 800 pounds per acre of the 3-12-12, 4-12-8 or 5-10-10 grades. If extra grass growth

1. Bill Crady, U. S. Potash Co., Meridian, Miss.; Grif Field, Meridian Fertilizer Co., Hattiesburg, Miss.; Clyde Marshall, Commercial Solvents Corp., New York; Stanley Hackett, Dixie Fertilizer Co., Shreveport, La.; Bill Porterfield, National Potash Co., New York, and Vance Hancock, Dixie Fertilizer Co., Century, Tex.

2. Richard Thomas, Union Bag-Camp Paper Corp., Tulsa, Okla.; Jesse Woods, Chemical Specialties Co., Laredo, Tex.; Mr. & Mrs. Souter, Gan Jarred and Ewell Fox, all with Red Star Fertilizer Co., Sulphur Springs, Tex.

3. B. L. Henderson, Campbell Fertilizer Co., Jim Dawson, Fidelity Chemical Corp., both from Houston, Tex.; Bill Crady, U. S. Potash Co., Meridian, Miss.; Mrs. Stanley Hackett, Shreveport, La.; Mrs. Dawson, Houston, Tex.; Mrs. Crady, Meridian, Miss.; Mrs. Morgan and Niven Morgan, American Potash Institute, Shreveport, La.

4. Dick Falck, International Minerals & Chemical Corp., palms broom to R. A. Jenkins, Virginia-Carolina, during broom dance.

5. Mrs. Jordan Thorne, Mrs. R. F. Hopkins, R. F. Hopkins, San Jacinto Chemical Co., Houston, Tex.; Jordan Thorne, Grand River Chemical Div., Deere & Co., Pryor, Okla., and J. H. Lanier, San Jacinto Chemical Co., Houston, Tex.

6. Stanley Hackett, Dixie Fertilizer Co., Shreveport, La.; Clyde Marshall, Commercial Solvents Corp., Bill Porterfield, National Potash Co., both of New York; Jerry Clower, Mississippi Chemical Co., Yazoo City, Miss.; Walter Young, Commercial Solvents Corp., Mt. Pleasant, Tex.; John R. Taylor, Jr., Grand River Chemical Div., Deere & Co., Pryor, Okla.; Warner Anthony, Farm Service, Inc., Opelousas, La.; R. L. Warren, Rohn & Haas Co., Pasadena, Tex.

7. Tom Jones, Southern Farm Supply, Amarillo, Tex.; Massey McConnel, Commercial Solvents Corp., Sterlington, La.; Archie Edwards and Mrs. Edwards, Red Star Fertilizer Co., Sulphur Springs, Tex.

8. Mr. and Mrs. Arnold Newman, Longhorn Construction Co., Sulphur Springs, Tex.; Pete Stultz, Red Star Fertilizer Co., Sulphur Springs, Tex.; Mrs. Jack Carlisle; Mr. and Mrs. Bill Brashear, National Potash Co., Shreveport, La.; Jack Carlisle, Jacksonville Fertilizer Co., Jacksonville, Tex.; Mr. and Mrs. R. D. Falk, Owens-Illinois Co., Houston, Tex.; John Henry Sharp, L.S.U., Baton Rouge, La.

9. Seated: Zaney Blaney, the Magician; H. E. Brooks, International Minerals & Chemical Corp., Texarkana, Ark.; Standing: Bill Ford, Monsanto Chemical Co., New Orleans, La.; Mr. & Mrs. Bill Brashear, National Potash Co., Shreveport, La.; Beal Hargrove, Monsanto Chemical Co., and Dale Campbell, Red Star Fertilizer Co., Sulphur Springs, Tex.

10. Jim Oates, Monsanto Chemical Co.; Mrs. Doug Kelly, Mr. & Mrs. Joe Wright, Texas Farm Products Co., Nacogdoches, Tex.; Sam Clement, Monsanto Chemical Co.; Bill Burns, International Minerals & Chemical Co.; Mrs. Joe Wepfer, El Dorado, Ark.; Mrs. Oates; Mrs. Sam Clement; Doug Kelly, Monsanto Chemical Co.

is desired in the mixed pasture, one or more top dressings of nitrogen at rates of 30 to 60 pounds per acre should be applied. On established clover sods, use 400 pounds per acre of 0-14-14 or 0-16-8.

Grass pastures on upland soils should be fertilized at or before planting with 20 to 60 pounds of N, 40 to 100 pounds of P_2O_5 and 40 to 60 pounds per acre of K_2O. This plant food may be supplied with applications of 400 to 800 pounds per acre of 3-12-12, 5-10-10, 4-12-8, 5-10-5 or 8-8-8 grades or equivalent amounts of higher multiples. In addition to the fertilizer applied before planting the grass should be top dressed from one to three times during the growing season with 30 to 60 pounds per acre of nitrogen at each top dressing.

Clover in clover-grass pastures should be fertilized each fall with 60 pounds of P_2O_5 and 60 pounds of K_2O. To the grass in May after clover apply 60 pounds per acre of nitrogen and make later applications as needed.

On the alluvial soils, the application of 30 to 60 pounds per acre of nitrogen to grass in either liquid or solid carriers at or before planting and later applications of 30 to 60 pounds of nitrogen at each of two or more intervals during the growing season are giving excellent results.

Some soils in the alluvial areas are low in available phosphorus and potassium. Most of the soils in the upland areas are in need of lime. Soil samples from the areas to be put in pasture should be sent to the Soil Testing Laboratory in order to obtain more specific information about the fertilizer and lime requirements for pastures on each farm.

Park Yeates, Director of Feed and Fertilizer Division for Oklahoma, represented Oklahoma and he mentioned that the approved ratios and grades for 1957-58 would be essentially the same as for the past season.

Dr. J. F. Fudge of Texas mentioned that the approved Texas grades for 1957-58 would be released in the near future.

The new Planning Committee was revealed as follows: Mr. and Mrs. Stanley Hackett, Dixie Fertilizer Co., Shreveport, La., with Mr. Hackett to continue as chairman; Dr. and Mrs. J. F. Fudge, Texas state chemist, College Station, Texas; Dr. and Mrs. Niven Morgan, American Potash Institute, Shreveport, La.; Mr. and Mrs. R. M. Morehead, Olin Mathieson Chemical Corp., Little Rock, Ark.; Mr. and Mrs. Harold Trammell, Farmers Fertilizer Co., Texarkana, Texas; Mr. and Mrs. Jordan Thorne, Grand River Chemical Division of Deere & Co., Pryor, Okla., and Mr. and Mrs. Tom Wright, Texas Farm Products Co., Nacogdoches, Texas. Dr. Paul J. Talley, Monsanto Chemical Co., St. Louis, was named publicity chairman.

The 1958 meeting will be held July 16-19 at the Buccaneer Hotel, Galveston, Texas. In addition to a golf and bridge tournament there is a possibility of a skeet shooting contest and a fishing rodeo.

CHANGES

Turner

Dr. Naftel

United States Potash has established a plant food development department, with **Dr. James A. Naftel** as director and **James R. Turner** as chief agronomist. Prior to the merger of USP with **US Borax & Chemical,** Dr. Naftel was manager of the plant food department of **Pacific Coast Borax,** and Mr. Turner was Southern agronomist. The new department will have an office at Auburn, Ala., and another at New York City division headquarters, which are now located at 50 Rockefeller Plaza.

* * *

Virginia-Carolina, in addition to the two marginal plants reported closed here last month, has closed Wadesboro, N. C. General Manager **Charles Harding** points out that these are all plants located near other V-C plants, and marginal in nature, none employing more than 40-50 even at busiest seasons.

* * *

Commercial Solvents Corporation is opening a Mid-Atlantic office with headquarters at 196-202 Blanchard Street, Newark, New Jersey, according to an announcement by **J. V. O'Leary,** general sales manager. This office will serve New Jersey, Eastern Pennsylvania, Maryland, Delaware, District of Columbia, Virginia and North Carolina.

Arthur W. Luedeke has been appointed manager of the new district. Mr. Luedeke joined CSC in 1937, becoming district manager of the Cleveland office in 1941, and of the New York office in 1952.

* * *

Robert I. Sutter has been promoted to division manager in the Multiwall Department of **Hudson Pulp & Paper Corp.,** and will supervise multiwall shipping sack sales activities in the Ohio, Michigan, West Virginia and Pennsylvania region. Formerly a district manager, Mr. Sutter will continue to make Cleveland his headquarters.

Harry J. Uldricks has been appointed a sales representative to cover the southern Ohio, Pittsburgh and Charleston, W. Va. region under the Cleveland division office. Columbus will be his headquarters.

Joseph Leroy Blancett has been appointed district manager responsible for sales and service activities in the Arkansas-Mississippi, western Oklahoma region with headquarters in Little Rock, Ark. He was formerly with **Fulton Bag & Cotton Mills** in a similar capacity.

Phosphate Deposits In North Carolina

A federal geologist has reported to the N. C. State Conservation and Development Board that he had found evidence of fairly heavy amounts of phosphatic sands in Beaufort County.

Bear Creek Mining Co. has said they would build a $25-million plant in the area if phosphate deposits justified the cost.

Personals

H. E. Causey, for 20 years associated with the fertilizer business, who has joined International Minerals & Chemical Corporation as technical sales engineer with the agricultural sales department of the company's Potash Division. IMCC announced that Mr. Causey will work directly with fertilizer manufacturers, acting as the company's field representative in assisting with the solution of technical production problems. Mr. Causey had been associated since 1954 with the Illinois Farm Supply Company as manager of the Tuscola, Ill., plant, on which he supervised construction.

John N. Mahan has joined the **USDA** agricultural chemicals staff of the Food and Materials Requirements Division, Commodity Stabilization Service, to fill the spot occupied in 1955 and 1956 by **A. L. Mehring**. He will work primarily with fertilizers and will develop "The Fertilizer Situation" published by this staff. Mr. Mahan was formerly with **TVA** as head of the distribution economics section, fertilizer distribution branch.

* * *

Robert L. Riggs has been appointed manager of the Hopewell, Va., plant of **Nitrogen Division,** Allied Chemical & Dye Corp. Mr. Riggs succeeds **Frank A. Ernst** who retired August 31, and has been manager of the company's Omaha plant. Hopewell is the largest nitrogen plant in the United States.

Virgil A. Peringer will succeed Mr. Riggs as Omaha plant manager, moving up from general superintendent.

* * *

M. G. Woodward was elected a vice president of **Southern Nitrogen Company, Inc.** at a recent meeting of the board of directors. Mr. Woodward was previously treasurer and assistant secretary of the company and will continue to serve in these offices.

* * *

A. B. Chadwick has been appointed director of manufacturing for **Velsicol Chemical Corporation.** According to **E. T. Collinsworth, Jr.,** executive vice-president, Mr. Chadwick will supervise the manufacture of Chlordane, Heptachlor, Endrin and Methyl Parathion insecticides, hydrocarbon resins, solvents, and other chemical products at the Velsicol plants in Marshall, Illinois, and Memphis, Tennessee.

* * *

Walter I. Rodgers of the New York general sales division, **Bemis Bro. Bag Company,** has been named assistant to the president in the company's Boston office. His duties will include both administrative assistance to President **F. G. Bemis** and work on special projects. Mr. Rodgers joined Bemis in 1947.

* * *

Atkins, Kroll & Co. announces several shifts of key personnel. **W. A. Ashman,** partner, for the past two years resident in Los Angeles, returns to his post at San Francisco headquarters. **E. T. Tolin** resumes as manager of Southern California operations. He is being succeeded in the New York office by **C. E. Tanner,** formerly of **Wessel Duval Co. R. E. Lowe** will continue in charge of fertilizer sales in Southern California and Arizona.

* * *

Theodore E. Casselman, Jr., has been appointed chief chemical engineer of **Stone & Webster Engineering Corporation,** it was announced by **Fred W. Argue,** vice president and engineering manager. Mr. Casselman joined Stone & Webster in 1935.

* * *

W. B. Copeland has been appointed division vice president of the plant food division of **Olin Mathieson Chemical Corporation,** according to an announcement by **S. L. Nevins,** corporate vice president. Mr. Copeland was previously executive vice president of **Smith-Douglass** Company.

* * *

George F. Helfert was elected treasurer of the **Richmond Guano Company** August 7. He has been connected with the company as assistant treasurer since April 1956.

* * *

The following appointments at the Garfield, Utah plant were announced by **E. I. Lentz,** vice president and general manager, **Western Phosphates, Inc.**

George H. Reid has been made plant manager succeeding **E. R. Scammell** who has resigned. Mr.

Donald G. Zinter, who has been assigned as sales representative for Du Pont nitrogen products to a new sales territory covering southern Delaware, Maryland, the District of Columbia, and parts of Virginia and West Virginia.

W. J. Ray, supervisor of multiwall bag sales for the Bemis Bro. Bag Company, who has been named assistant manager of the company's multiwall paper bag plant in Mobile, Alabama. He joined Bemis in 1933.

David H. Bradford, Jr., sales manager of Mid-South Chemical Corporation, who has been elected vice president. He has been sales manager of Mid-South Chemical since it was first organized nine years ago.

Reid has been production superintendent of the Garfield plant since operation began in 1953.

James A. Malloch has been promoted from maintenance superintendent to chief engineer with responsibility for all engineering and maintenance activities. Mr. Malloch joined Western Phosphates in 1953.

Western Phosphates, Inc., produces phosphoric acid, triple superphosphate and ammonium phosphate at Garfield, Utah. It is owned by **Stauffer Chemical Company** (50%) and **Kennecott Copper Corporation** and **American Smelting and Refining Company** (25% each).

* * *

Blaw-Knox Company, chemical plants division, Pittsburgh, has announced the promotion of **Robert A. Mitchell** to chief engineer of its Midwest headquarters at Chicago. In his new position Mr. Mitchell will direct all engineering design and estimate work at the Chicago location.

* * *

Arthur O. Carraway, controller, **F. S. Royster Guano Company,** Norfolk, Virginia, has been elected to membership in the Controllers Institute of America.

Established in 1931, the Institute is a non-profit management organization of controllers and finance officers from all lines of business—banking, manufacturing, distribution, utilities, transportation, etc. The total membership exceeds 4,600.

Louis E. (Pete) Wheeling who has recently joined the sales department of Mississippi River Chemical Company, according to John L. Sanders, sales manager. Mr. Wheeling will assist Bradley & Baker, their sales agents, in marketing the nitrogenous products produced by Mississippi River Chemical.

Dave Flook has been named sales representative for Raymond Bag Corporation in the Rocky Mountain area, and will headquarter in the Commonwealth Building, Denver, Colo. He has just completed the recently-inaugurated sales training course—designed to give a thorough background on multiwall bag manufacturing and client service to new Raymond representatives—at the firm's Middletown, Ohio, offices.

Raymond Bag Company has announced the appointment of the Traylor Chemical and Supply Company, Orlando, as its authorized sales representative in the Florida area. J. J. Eaton, shown here, vice president of Traylor, will be in charge of sales and service for Raymond's complete line of multiwall bags.

* * *

Virginia-Carolina Chemical Corp. has named three assistant sales managers in its chemical division.

They are **Charles W. Farlow,** inorganic chemicals; **Dr. J. Samuel Gillespie, agricultural chemicals,** and **James L. Taylor,** organic chemicals.

Mr. Farlow, who joined V-C in 1954, has sold chemicals in the Atlantic and Cincinnati territories. Dr. Gillespie, who joined V-C's research department in 1951, was shifted to his new post from the fiber division. Mr. Taylor joined the firm as a chemicals salesman in 1948.

John R. Thompson has joined the V-C bag division as sales coordinator, according to **D. Harold Johnson,** division manager. In making the announcement, Johnson said that the position of sales coordinator has been created as a part of the bag division's expansion program.

* * *

Paul L. Weller has been appointed eastern representative of the research and development division of **Spencer Chemical Company** and will be located in the company's New York offices. He joined them in 1953.

Dalrymple Pointer

The Smith-Douglass Co. has announced the appointment of **J. J. Pointer** as assistant sales manager for their Eastern Fertilizer Division, effective September 1. Pointer joined the company in 1939, and has managed the Wilmington, N. C., plant since 1952. He will headquarter in Norfolk. S-D's eastern fertilizer division consists of plants at Norfolk and Danville, Va., with plants or sales offices at Greensboro, Statesville, Kinston, Washington, and Wilmington, N. C.

John J. Dalrymple was named to succeed Pointer as manager of the Wilmington plant. He joined S-D in 1935 and has formerly supervised a sales territory.

Smith-Douglass also announced that **M. A. Glass** will transfer to the company's Midwestern fertilizer division, where he will continue to serve as an assistant sales manager. The company operates plants at Streator, Ill., and Albert Lea, Minn.

J. H. Culpepper, vice president, directs S-D's fertilizer sales. **P. T. Smith** is fertilizer sales manager.

* * *

Directors of **American Cyanamid Co.** have announced election of **Dr. Wilbur G. Malcolm,** formerly vice president for marketing, as president and chief executive officer of the company.

He succeeds **Kenneth C. Towe,** who was elected to the newly-created post of chairman of the board.

* * *

Garvin C. Matthiesen has been named assistant to the manager of Fertilizer Manufacturing Sales by **Nitrogen Division, Allied Chemical & Dye Corp. Ernest M. Harper,** who has been midwest product sales supervisor for nitrogen solutions, succeeds Matthiesen as midwest sales supervisor, Direct Application Materials. Both men will be located at the company's main office in New York.

Harper Matthiesen

Jack F. Dulaney, formerly district sales manager of the Southwest area of the Nitrogen Division of Allied Chemical and Dye Corp., has been appointed sales manager, Fertilizer Manufacturing sales, of the Atlanta, Ga. district, where he will have headquarters in the Candler Building. He has previously been headquartered at Memphis, Tenn.

West German Fertilizer Capacity Expanding

The output of nitrogenous and phosphatic fertilizers in West Germany increased 6.1 percent and 8.4 percent, respectively, in 1956. New construction and the expansion of existing facilities extended the combined capacity of 10 primary nitrogen plants, 3 "lime" nitrogen plants, and 78 cokeries to more than 1 million tons annually. World capacity is about 9 million tons. Eighty percent of Germany's nitrogen sales went to fertilizers, of which two-thirds was used at home and one-third went abroad. The remaining 20 percent was used for technical purposes.

Capacity for phosphatic materials was expanded during the year by Knapsack Griesheim AG., Knapsack, near Cologne, which increased substantially its production facilities for elemental phosphorus, phosphoric acid, and phosphates.

The government statistical office, Statistisches Bundesamt, lists potassic fertilizers under mining products. The output of these materials declined 2.5 percent to 1,654,000 tons in 1956 from 1,697,000 tons in 1955 (K_2O content.) The output of pure potash is estimated at 1.7 million tons, compared with 1.4 million tons in East Germany and world production of 6.6 million tons. Table 32 shows production of the three principal types of plant foods.

Unfavorable weather conditions in the spring of 1956 had an adverse effect on total fertilizer sales, especially on those of phosphatic and potassic materials. Nitrogenous fertilizers, which can be used later in the year, were not as hard hit. Sales of the latter are expected to reach 500,000 tons during the current fertilizer year 1956-57 and 530,000 tons in 1957-58. The rise for potassic fertilizers in the corresponding years is estimated at 6.8 percent and 8.4 percent, respectively.

Table 33 shows sales of fertilizers in the agricultural years 1954-55 and 1955-56.

Consumption of plant foods in Germany has continued to lag behind that in the Netherlands and Belgium, but an upturn is anticipated in the 1956-57 agricultural year as a result of a government subsidy which became effective in April 1956 and provides for payment of an allowance to individual farmers on the basic of actual fertilizer consumption. Table 34 shows consumption of fertilizers in the years 1954-55 and 1955-56.

A development not reflected in these figures is the increased use of "complete" fertilizers containing all three plant foods and combining their nutritive values. Scholven Chemie AG., Gelsenkirchen-Buer, which expanded its capacity for liquid ammonia from 38,000 to 54,000 tons (N content) in 1956, is operating a "complete fertilizer" plant.

West German Production of Fertilizers, 1955-56

(In metric tons)

Type	1955	1956	Percent change
Nitrogenous (N content)	763,065	809,567	+6.1
Phosphatic (P_2O_5 content)	524,705	569,643	+8.6
Potassic[1]	1,697,000	1,654,000	—2.5

[1] Potassic fertilizers are listed under mineral products.
Source: Statistisches Bundesamt, Wiesbaden.

Sales of Fertilizers in West Germany, 1954-55 and 1955-56

(In metric tons, plant food content)

Type	1954-55[1]	1955-56[1]	Percent change
Nitrogenous	452,000	472,000	+ 4.4
Phosphatic	518,000	479,000	— 7.5
Potassic	859,000	847,000	— 1.4
Lime	653,000	741,000	+13.5

[1] Fertilizer year.
Source: West German Federal Ministry of Agriculture, Bonn.

West German Consumption of Fertilizers, 1954-55 and 1955-56

(In kilograms per hectare[1] of available land)

Type	1954-55[2]	1955-56[2]	Percent change
Nitrogenous	31.7	33.1	+4.4
Phosphatic	36.3	33.6	—7.4
Potassic	60.2	59.4	—1.3
Lime	45.8	52.0	+1.4

[1] 1 hectare equals 2.47 acres. [2]Fertilizer year.
Source: Official German statistics.

Potash Deliveries Rise in First Half

Deliveries of potash for agricultural purposes in the United States, Canada, Cuba, Puerto Rico, and Hawaii totaled 2,016,465 tons of salts containing an equivalent of 1,187,113 tons K_2O during the first six months of 1957, according to the American Potash Institute. This was an increase of nearly 7% in salts and K_2O over the same period in 1956. Continental United States took 1,111,234 tons K_2O, Canada, 40,288 tons, Cuba, 8,855 tons, Puerto Rico, 14,296 tons, and Hawaii, 12,440 tons K_2O. These figures include imports of 79,971 tons K_2O for the first five months of the year, a decrease of about 3% under last year. Exports to other countries were 133, 454 tons K_2O, an increase of 132%. Deliveries of potash for non-agricultural purposes amounted to 61,098 tons K_2O, a decrease of 10% under last year.

During the second quarter of 1957, deliveries for agricultural purposes were 559,297 tons K_2O in Continental United, 25,804 tons in Canada, 5,217 tons in Cuba, 10,665 tons in Puerto Rico, and 4,441 tons in Hawaii making a total of 605,424 tons K_2O, an increase of 18% over last year.

Canada Industry Stabilizing

Canda's chemical fertilizer industry, after a period of dwindling export sales, appears this year to have stabilized its position in world markets, at least temporarily.

In 1956, export sales slumped by 12.6 per cent, compared with the previous year. The sharpest sales loss occurred in the first half of the year, for in the last six months sales were down by only 3.6 per cent.

This year, exports in the first four months eased by only .47 per cent.

Export markets are more important to fertilizer producers than to

most other manufacturers in Canada. Canadian consumption absorbs somewhat less than one-half the domestic output of fertilizers. The remainder is sold in the U.S. and in overseas markets as distant as the Orient.

The heavy weather currently being encountered by the industry in world markets is the result of major expansion of productive capacity in the U.S., and the re-emergence of Japan as an important supplier in the Far East. The Japanese fertilizer industry now ranks as the world's third largest, after the U.S. and Western Germany.

Canadian firms in 1956 produced fertilizers valued at $82,800,000—a 10.5 per cent drop from the record level of $92,498,830 in 1955. Exports were valued at $49,211,000 in 1956, compared with $56,296,000 in the previous year.

Of the export total in 1955, fertilizers worth $5,200,000 went to Korea and $2,800,000 worth was sold in East and Southeast Asia. This market is under pressure from Japan, which has spurred efforts to make ammonium sulphate fertilizer, which she can make readily. Japan is less competitive in phosphate fertilizers, because of her need to import phosphate rock.

Canadian producers also rely on imported phosphate rock—much of it brought in from Florida. In fact, of the three basic chemical plant foods, phosphate, potash and nitrogen, only nitrogen is readily available in Canada. Developments now under way in Saskatchewan, however, will soon provide a large domestic source of potash.

MARKETS

ORGANICS: Most producers of Organic Ammoniates for fertilizer use are in comfortably sold position for the new season, the price of Nitrogenous Tankage ranging from $2.75 to $3.75 per unit of Ammonia for July through September shipment, $3.00 to $4.00 for October through December and $3.25 to $4.25 January/forward, depending on location of point of production.

SEWAGE SLUDGE: One major producer is pricing at $2.60 per unit of ammonia and 50¢ per unit of APA f.o.b. Midwest production point for July through September and 50¢ per unit of ammonia higher for October/forward. Another production is indicated at $2.75 per unit of Nitrogen and 50¢ per unit of APA f.o.b. Southwest production point for the entire season.

CASTOR POMACE: No current offerings are in the market for domestic production. The last price paid was $45.50 per ton in bags, f.o.b. Eastern Seaboard shipping point. Producers are not expected to have any supplies until possibly October, November or December.

DRIED BLOOD: Unground, sacked Blood is indicated at Chicago around $6.00 to $6.25 per unit of Ammonia and in the New York area at around $5.00 to $5.50.

POTASH: No unusual developments in this market. Movement to fertilizer manufacturers from domestic sources is in seasonal volume.

GROUND COTTON BUR ASH: This form of Potash testing 38/40% K_2O, of which approximately 70% is in the form of Carbonate of Potash, continues to move in steady volume for specialty use and compares favorably with the cost of Sulphate of Potash in most areas.

SUPERPHOSPHATE: Producers are beginning to increase slightly volume of production, while building stocks for the new season. Price at Charleston is indicated at 74¢ to 76¢ per unit of APA, bulk, depending on the analysis, and at Savannah 75¢ to 76¢.

PHOSPHATE ROCK: Stocks are in adequate proportions and movement is in seasonal dimension. Prices are firm.

CALCIUM AMMONIUM NITRATE: Demand is at a low seasonal level and very little movement is reported. Prices continue at previous levels.

AMMONIUM NITRATE: Demand is entirely seasonal and movement is currently in low volume. Prices continue as previously announced for the season.

GENERAL: Manufacturers continue with limited mixing, which is mostly preparatory for the fall season. The market on organic ammoniates is in good shape and most raw materials are at prices fairly well in line with those that prevailed during the past season. The increased freights during the past eight months will, in most cases, offset any slightly lower prices on a delivered basis to mixers.

CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

STATE	July 1957	July 1956	June 1957	June 1956	Apr.-June Qtr. 1957	Apr.-June Qtr. 1956	Jan-Mar. Qtr. 1957	Jan-Mar. Qtr. 1956	July-December 1956	July-December 1955	YEAR (July-June) 1956-57	YEAR (July-June) 1955-56
Alabama	.....	16,462[1]	62,720	56,254	517,785	524,594	291,118	347,956	174,707	165,867	983,607	1,042,416
Arkansas	.....	11,869[1]	26,835	25,691	144,366	157,191	120,899	141,981	59,915	60,299	325,150	359,471
Georgia	60,490	46,437	136,249	147,230	759,449	771,592	221,375	216,862	253,559	250,968	1,234,383	1,244,422
Kentucky	.....	5,336[1]	.....	23,459[1]	.....	273,110[1]	173,850	168,371	90,284	91,478	.....	421,597[1]
Louisiana	11,459	7,852	25,940	19,883	117,568	120,874	82,709	93,469	71,129	59,345	271,406	273,688
Missouri	.....	26,842[1]	50,368	23,882	240,798	208,976	219,689	235,254	331,343	356,241	791,830	800,471
N. Carolina	.....	14,968[1]	66,203	88,223	765,579	742,370	534,774	581,897	216,234	225,182	1,516,587	1,649,449
Oklahoma	4,351	3,396	5,860	6,086	24,968	33,970	27,868	31,884	54,509	69,542	107,345	135,396
S. Carolina	11,248	12,764	29,475	33,262	102,001	121,586	393,741	452,619	122,929	119,947	817,500	863,617
Tennessee	18,506	24,536	110,689	108,890	334,808	327,890	48,649	50,736	165,796	154,260	549,253	532,886
Texas	44,039	24,199	54,128	49,681	187,223	191,893	205,547	180,802	202,406	193,704	595,176	566,399
California	(reports compiled quarterly)				.....	358,524[1]	264,270	280,853	412,747	361,615	.....	1,001,554[1]
Virginia	(reports compiled quarterly)				323,024	325,469	277,124	273,642	154,075	162,709	754,223	761,820
Indiana	(reports compiled semi-annually)								305,917	255,131	.....	1,063,049
Iowa	(reports compiled semi-annually)								85,147	130,000	.....	445,329[1]
Michigan	(reports compiled semi-annually)								184,763[1]	*	.....	*
New Hampshire	(reports compiled semi-annually)								3,253[1]	*	.....	*
Washington	(reports compiled semi-annually)								55,709	48,749	.....	152,674[1]
Connecticut	(report issued annually)								.....	.....	.....	76,660[1]
Oregon	(report issued annually)								62,147[1]	*	.....	*
TOTAL	150,093	119,184	568,467	559,082	3,517,569	3,526,405	2,861,613	3,056,326	2,756,406	2,705,037	7,946,460	8,230,035

..... (not yet reported) * Not compiled [1] Omitted from column total to allow comparison with some period of current year.

Pac N. W. Convention Ready for Oct. 3-5

Sun Valley, Idaho is the scene, and October 3-5 are the dates of the annual convention of the Pacific Northwest Plant Food Association. The meeting will be held at the famed Challenger Inn.

The convention plans call for a barbecue dinner the evening of October 3, a banquet the next evening, with business sessions Friday and Saturday mornings. The rest of the time is left wide open for recreation, in which Sun Valley abounds.

Iowa State Staging Dec. Short Course

A short course for fertilizer dealers and a manufacturers conference will be held at the Memorial Union, the short course on December 4, the manufacturer's conference on the previous day. The events are being staged by the Iowa State Extension Service, with J. A. Stritzel, extension agronomist, as chairman of the short course. We have been asked to extend a broad invitation to all who may be interested. For details, write Dr. Stritzel at the college, Ames, Iowa.

OBITUARIES

Hyman J. Bowen, 58, assistant superintendent, East Point, Ga., branch of the Tennessee Corp, died August 8 in hospital.

Burton A. Ford, 63, with St. Regis Paper since 1928, died in his home, Allentown, Pa., August 8.

Stapleton D. Gooch, 68, phosphate pioneer, died in his sleep at home, Lake Wales, Fla., July 25. He was president of Dolomite Co., Diamond Sand Co., Goochland Nurseries and secretary of Tyrone Rock Products Co.

William G. Howard, 81, owner of Howard-Iowa Products Co., Jefferson Ia. died in hospital July 9, after a short illness.

Frank W. Hugi, 61, president of Weaver & Hugi, Inc., brokers, died July 18 at his home in Staten Island, New York.

Roy B. Johns, 64, vice-president and salesmanager of Freeport Sulphur and with them since 1915, died at his Great Neck, Long Island, home July 23.

INDUSTRY CALENDAR

Date	Organization	Place	City
Sept. 24-25	New England Fert. Conf.	Bald Peak Club	Mil'vn Vl'ge, N.H.
Oct. 3-5	Pacific N.W. Plant Food	Challenger Inn	Sun Valley, Ida.
Oct. 17	Chem. Control Procedures	Shoreham Hotel	Washington, D.C.
Oct. 17-18	Control Officials Assn.	Shoreham Hotel	Washington, D.C.
Oct. 21-22	Fertilizer Safety Section	La Salle Hotel	Chicago, Ill.
Oct. 31	Southern Fert. Conf.	Dinkler Plaza	Atlanta, Ga.
Nov. 1	Sou. Soil Fertility Conf.	Dinkler Plaza	Atlanta, Ga.
Nov. 3-5	Calif. Fert. Assn.	St. Francis Hotel	San Francisco
Nov. 6-8	Fert. Indus. Round Table	Sheraton Park	Washington, D.C.
Nov. 17-19	Nat'l Fert. Solutions Assn.	Netherland-Hilton	Cincinnati, Ohio
Nov. 18-22	Amer. Soc. Agronomy	Atlanta Biltmore	Atlanta, Ga.
Dec. 11-13	Ag. Ammonia Inst.	Marion Hotel	Little Rock, Ark.
		1958	
Jan. 7-8	Texas Fert. Conf.	Memorial Center	College Station
Feb. 13-14	MidWest Soil Impr.	Edgewater Beach	Chicago, Ill.

Chase Offers Fertilizer Packer

Newest bagging unit for the fertilizer industry is Chase Bag Company's "Southland Packer," a completely automatic, all-electric device for filling and weighing open mouth textile or multiwall paper bags.

Distributed exclusively by Chase, the "Southland" is manufactured by Chattanooga Boiler and Tank Company, one of the oldest metal fabrication specialists in the industry.

Fast handling of 50, 80 and 100-lb. multiwall paper bags is assured, with 25 bags per minute a typical working speed. Even 200-lb. burlaps pack rapidly and easily. Sustained high accuracy of weights over an extended run is guaranteed.

Minimum change-over time from one analysis to another is an outstanding feature of the new "Southland." Cylindrical hoppers and buckets allow a clean and complete flow of material. Simplicity of design reduces maintenance costs and problems. Parts are standardized, can easily be interchanged in plants where more than one packer is in use. No air or hydraulic fittings are used, thereby eliminating the need for supplemental equipment.

The "Southland Packer" is made from 12 gauge or heavier steel plate and requires no external bracing for rigidity. The feeder is of the continuous operating type, using a ½ H.P. gear-enclosed motor to operate its endless belt. over 8" self-cleaning pulleys. The large diameter of the pulleys together with their self-cleaning feature increases belt life.

Complete information about the packer can be obtained from the Chase Bag Company, 525 International Trade Mart, Camp and Common Streets, New Orleans, La. Model A "Southland Packer," constructed of high quality heavy gauge carbon steel, is priced at $2,500.00 F.O.B. Chattanooga, Tennessee, with either a 50-lb. or an 80-lb. bagging spout. On special order, the "Southland" and its various parts can be furnished in 100% stainless steel construction, as required.

Application Group Meets With Soil Scientists

Nationally-known agricultural scientists were to be heard at the Thirty-third Annual Meeting of the National Joint Committee on Fertilizer Application held in conjunction with the American Society for Horticultural Science and the Western Society of Soil Science, at Stanford University, Palo Alto, Calif., August 27. Dr. Willard H. Garman, secretary of the Committee and chief agronomist of the National Plant Food Institute, announced the meeting.

Dr. O. A. Lorenz, vice chairman of the Committee, University of California, Riverside, presided. C. E. Guelle of the International Harvester Company, Chicago, is chairman of the Committee.

Speakers and their subjects for the meeting on August 27 were listed as:

Dr. Hans Jenny, professor of Soil Chemistry and Morphology, Department of Soils and Plant Nutrition, University of California, Berkeley, on: "Availability of Various Phosphorus Sources in California Soils";

Dr. W. W. Jones, horticulturist, Department of Horticulture, University of California, Riverside, on: "Urea Sprays on Citrus";

Dr. Francis Broadbent, associate soil microbiologist, Department of Soils and Plant Nutrition, University of California, Davis, on: "Nutrification of Ammonia-Containing Compounds";

Dr. Leon Berstein, plant physiologist, U. S. Salinity Laboratories, Riverside, on: "Movement of Soluble Salts in Irrigated Beds";

Dr. Walter P. Mortensen, assistant soil scientist, Western Washington Experiment Station, Puyallup, Washington, on: "Placement of Liquid and Dry Fertilizers on Vegetable Crops in Washington";

Dr. F. H. Leavitt, Shell Development Company, Modesto, on: "Application of Liquid and Gaseous Fertilizers"; and

Dr. N. F. Childers, Chairman, Department of Horticulture, Rutgers University, New Brunswick, N. J., on: "The Occurrence and Methods for Correcting Nutrient Deficiencies in Deciduous and Small Fruit Plantings in the United States."

The annual business meeting of the National Joint Committee on Fertilizer Application was held on August 26, also at Stanford University.

Middle West Committee Studies NPFI Merger Plan

Middle West Soil Improvement Committee's headquarters in Chicago may become the Midwest regional office for National Plant Food Institute if current negotiations between the groups are successful.

Officers and directors of the two fertilizer industry associations are studying proposals regarding the possible merger, and their sentiments are reported as favorable to the move, provided satisfactory arrangements can be worked out.

As NPFI's expanded program to set up regional centers—approved at the Institute's June meeting—calls for tentative location of an office in Chicago to serve the middle west, the Institute stands to acquire an effective, "going" organization to function as the neucleus of its program in that area.

MWSIC directors are reportedly looking on the consolidation as a means of further extending the Committee's program through the backing of the national association.

Final plans are now being drawn for presentation to the officers and directors, and an announcement of the outcome of the negotiations is expected in the near future.

RN & Q

Continued from page 38

To speed fermentation, a catalyzer such as potato yeast culture and hippuric acid can be added. Mix well for a few days with a worm-screw.

The final product should be chocolate brown, highly granular and highly flocculent.

The topsoil is the invention of John D. Larson, Hinsdale, Ill.

O

Grass studies are being made in Texas to determine if it pays to fertilize and the results indicate the answer is yes. Yields increased from 93% to 369% at a cost of $1.78 to $9.01 per ton. Big ranches cooperated in the test, and a wide variety of high analysis fertilizers were applied, with unfertilized check strips for comparison.

O

Johnson Grass dies the death from a single application of HCA, the new General Chemical Division weed killer. It kills other weed grasses too—and your editor wishes he had some right now, except that it also kills Bermuda, which in the South is something to be encouraged.

O

Stauffer has registration papers now on Trithion, their organic phosphate insecticide and acaracide, which has been on an experimental-sale basis up to now.

O

A folder on the use of toxaphene insecticides has been issued by Hercules Powder.

O

Duramycin, a compound from an antibiotic mixture, may turn out to be the answer to a number of crop diseases. It is important enough to have had a paper read at the American Chemical Society here lately.

CLASSIFIED ADVERTISING

For Sale, Exchange and Wanted Advertisements, same type now used, EIGHT CENTS a word for one insertion; TWELVE CENTS a word for two insertions; FIFTEEN CENTS a word for three insertions, and FOUR CENTS a word for each insertion more than three; ADVERTISEMENTS FOR THIS COLUMN MUST BE PAID IN ADVANCE.

HELP WANTED

WANTED: Combination lead burner and sulphuric acid man for chamber type plant. Also, shipping foreman. Write, giving full details of experience, educational background, age, salary expected, and references. Box #21, c/o Commercial Fertilizer, 75 - 3rd St., N.W. Atlanta 8, Ga.

SITUATIONS WANTED

WANTED: Position as plant superintendent, experienced in transportation and complete fertilizer plants. For reference and business resume, write Box 19, c/o Commercial Fertilizer, 75 - 3rd St., N. W. Atlanta 8, Ga.

EQUIPMENT FOR SALE

FOR SALE: Rotary Dryers 5' x 30', 5' x 40', 4'6" x 50', 5' x 67', 6' x 60', 9' x 80'. (1) Pressure Tank 13,000 gal. 220#. Also Mixers, Storage Tanks, Screens, Elevators. Send us your inquiries. Brill Equipment Company, 2402 Third Ave., New York 51, N. Y.

FOR SALE: Dewatering Presses, Louisville 8 Roll 36"; Davenport No. 1A, No. 2A; J. B. Model W. Hammer Mill; Ribbon Mixers, 336 and 56 cu. ft.; Gemco 6' dia. Conical Blender; Rotary Steam Tube Dryers 6' x 45', 4' x 30'. Steel & Aluminum Tanks 400 to 23,000 gal. Also, Pulverizers, Conveyors, etc. Perry Equipment Corp., 1426 N. 6th St., Philadelphia 22, Pa.

NEW EQUIPMENT AT FACTORY PRICES. NEW CONVEYOR BELTING FROM HUGE, FRESH STOCK. Vibrating screens from $443.00. Crushers from $527.00. Feeders from $275.00. All types of bucket elevators and belt conveyors. Steel troughing idlers and return rolls. Conveyor parts, accessories, and drives. All machines built in the Bonded factory. Buy your factory-fresh conveyor and elevator belting from one of the largest stocks in United States, Canada and Mexico. 4-ply, 28 oz. duck, $\frac{1}{8}$" x $\frac{1}{32}$" rubber covers: 14", $2.83 ft.; 16", $2.97 ft.; 18", $3.29 ft.; 20", $3.80 ft.; 24", $4.26 ft.; 30", $.5.21 ft.; 36", $6.18 ft. Many other widths, plies, and specifications in our fresh stock. FREE CATALOGUE AND PRICES: more than 200 models of Bonded machines for chemical, fertilizer, mining, quarrying, aggregate and clay industries. BELTING SAMPLES FREE. Bonded Scale Co., 42 Bellevue, Columbus, Ohio. Phone days HI. 4-2186; Evenings AX. 1-2213.

INDEX TO ADVERTISERS

Allied Chemical & Dye Corp., Nitrogen Div. ..... Front Cover, 19-22
American Agricultural Chemical Company, The
American Cyanamid Co., Phosphates Department 15
American Limestone Co.
American Potash & Chemical Corporation
Armour Fertilizer Works 62
Ashcraft-Wilkinson Co. 34, 58
Atlanta Utility Works 61

B.I.F. Industries, Omega Machine Co., Div.
Bagpak Division, International Paper Co.
Bemis Bro. Bag Co.
Berkshire Chemicals, Inc. 64
Blaw-Knox Company, Blaw-Knox Equipment Division
Blaw-Knox Company, Chemical Plants Division 18
Blue Valley Equipment Mfg. & Engineering Co.
Bonneville, Ltd.
Bradley & Baker
Burlap Council of Indian Jute Mills Assn. 39

Chase Bag Company
Cole Manufacturing Co., R. D. 54
Commercial Solvents Corporation
Continental Gin Co., Industrial Div. 16

Davidson-Kennedy Associates Co. 36
Davidson-Kennedy Co. 37
Davison Chemical Co., Div. W. R. Grace & Co. 26
Dow Chemical Company, The
du Pont De Nemours & Co. (Inc.), E. I. 13
Duval Sulphur and Potash Co. 34

Emulsol Chemical Sales Corporation
Fertilizer Equipment Sales Corporation 63
Fulton Bag & Cotton Mills

Grand River Chemical Division, Deere & Company 46

Hayes & Stolz Industrial Mfg. Co., Inc. 58
Hough Company, The Frank G.

International Minerals & Chemical Corporation
Phosphate Chemical Division 6-7
Phosphate Minerals Division
Potash Division 11
International Paper Company

Kraft Bag Corporation ..... Inside Front Cover

Lancaster Allwine & Rommel 61
Law & Company 63
Longhorn Construction Co. 55
Lummus Company, The 12

Marietta Concrete Corporation, The
McIver & Son, Alex M. 64

National Lime and Stone Co., The 55
National Potash Company 29
Nordberg Manufacturing Company 43

Omega Machine Company, Div. B.I.F. Industries

Phelps Dodge Refining Corporation
Phillips Chemical Company
Potash Company of America ..... Inside Back Cover

Quaker Oats Company, The (Chemical Dept.) 61

Raymond Bag Corporation 14
Renneburg & Sons Co., Edw.
Richardson Scale Company

Sackett and Sons Co., The A. J. 40, 41
St. Regis Paper Company, Multiwall Bag Division 17
Shuey & Co., Inc. 63
Simplicity Engineering Company
Sinclair Chemicals, Inc.
Smith-Rowland Company 3
Sohio Chemical Company
Southern Nitrogen Company, Inc. 10, 38
Southern States Phosphate and Fertilizer Co. 60
Southwest Potash Corporation 23
Spencer Chemical Company
Stedman Foundry & Machine Company, Inc. 60

Tennessee Corporation
Texas Company, The, Petrochemical Sales Division
Texas Gulf Sulphur Co.
Tull Metal & Supply Co., Inc., J. M. 61

Union Bag-Camp Paper Corporation 8
Union Special Machine Co. ..... Back Cover
U. S. Industrial Chemicals Co., Division of National Distillers & Chemical Corporation 30
U. S. Phosphoric Products Division, Tennessee Corp. 9
United States Potash Company, Div. United States Borax & Chemical Corp. 31
United States Steel Corporation

Weatherly Company, The D. M. 4
Wiley & Company, Inc. 63
Willingham-Little Stone Company 59
Woodward & Dickerson, Inc.

PLAIN SEWED CLOSURE

The simplest and most popular sewed closure for textile, paper-lined textile and paper bags of all sizes.

FOLDED TOP CLOSURE

An excellent plain sewed closure for multiwall paper bags. Bag top is folded over and sewed through to form a strong, neat closure.

TAPE-BOUND CLOSURE

Multiwall paper bags closed with tape-bound closures add to package sales appeal and provide a bag that can be handled without fear of closure breaks.

A Guide to
LOWER PACKING COSTS!
BETTER BAG CLOSURES!

If you're interested in bringing packing costs down, here is the way to do it. Take advantage of Union Special's wide knowledge of bag closing and its problems. By selecting your equipment from Union Special's complete line you can get the correct equipment for your particular job — equipment that will do it better, faster and cheaper, giving you a stronger closure at lower cost.

In the Union Special line you will find machines for closing all sizes and kinds of bags from small textile or paper bags up to the largest multiwall paper bags in use today. Whether your production schedule calls for closing just a few bags or for high continuous output, Union Special can supply the equipment to do the work efficiently, economically, dependably! *For detailed information, ask for a copy of Bulletin 200. See our nearest representative or write today.*

NEW BULLETIN 200

Just off the press—16 pages of information on equipment for closing bags.

CLASS 20500 (left) machines are heavy-duty, high production units for closing medium and heavy weight bags. Available with power-driven horizontal conveyor, inclined conveyor, or both; or with conveyor transmission unit only, for plant production line.

STYLE 80600 H

Sewing Head (left) is designed for making tape bound closure on multiwall paper bags. Automatic tape clipper.

Union Special®

BAG CLOSING MACHINES

Send for Information

Union Special Machine Company
412 North Franklin Street, Chicago 10, Illinois

Gentlemen:

Please send me new Bulletin 200, "Union Special Bag Closing Machines."

NAME_____

COMPANY_____

ADDRESS_____